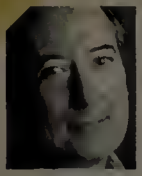
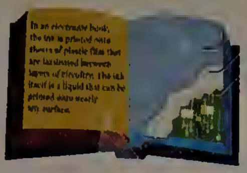


A NEW LANDGRAB?

Dan Gillmor says there's a race to control intellectual property that could have major implications for everyone who uses information. Page 34


In an electronic book, the ink is printed onto sheets of plastic film that are laminated between layers of circuitry. The ink itself is a liquid that can be printed onto nearly any surface.

FUTURE WATCH

Some companies are developing electronic paper – flexible sheets that can be instantly updated with new text and pictures. Page 67

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SUN ADMITS TO MEMORY PROBLEM

Firm tried to solve server mystery quietly for months, put a gag order on customers

BY JAIKUMAR VIJAYAN

RELIABILITY ISSUES

Problems with a memory component that Sun Microsystems Inc. has been quietly trying to fix for the past several months are continuing to plague some large users of Sun's Ultra Enterprise Unix servers. And Sun has gone to extraordinary lengths to keep its customers silent about the issue.

The problem involves an external memory cache on Sun's UltraSPARC II microprocessor module. Under certain conditions, the cache has been triggering system failures and frequent server reboots at dozens of customer locations.

Sun Executive Vice President John Shoemaker last week acknowledged that the company has been grappling with memory-related problems on "a few dozen" of its Ultra Enterprise servers for nearly a year.

Sun customers who have been affected by the problem are unwilling to speak openly about it because Sun has persuaded many of them to sign nondisclosure agreements, said Tom Henkel, an analyst at Gartner Group Inc. in Stamford, Conn.

Sun Problem, page 14

IT KEY IN RESPONSE TO SUMMER FIRES

Communications vital in fighting, surviving blazes

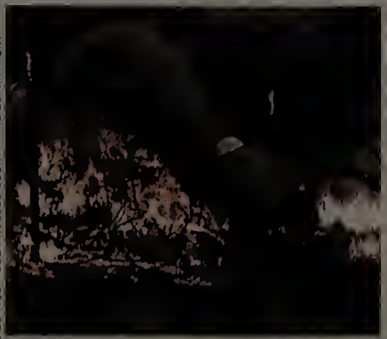
BY BOB BREWIN

Information technology resources have helped keep alive critical business operations and manage firefighting during this summer's raging blazes throughout the U.S. West.

A sophisticated communications system has been a vital tool for managing outages in Montana Power Co.'s high-voltage transmission system, said Leroy Patterson, the utility's director of systems operations. Much of Montana Power's 107,000-square-mile service area has been hit by forest fires.

Communications systems have also lent a hand to firefighters battling the fires, which have burned almost 9,000 square miles in the West this year. But communications managers at the National Interagency Fire Center in Boise, Idaho, said they are close to running out of the vital wireless communications kits used by firefighters and managers

Summer Fires, page 85



COURTESY STEVE BENTLEY, LOS ANGELES COUNTY FIRE DEPARTMENT

FIREFIGHTERS like these in the Sequoia National Forest rely on high-tech systems to stay in touch

TEXACO FUELS E-BIZ WITH $20M FUND

Launches worldwide intranet application

BY JULIA KING

Texaco Inc. is quietly executing a comprehensive electronic-business strategy that includes bringing online an electronic procurement system by Jan. 1 and creating hundreds of digital communities that link 18,500 employees worldwide.

The $36 billion White Plains, N.Y.-based energy giant has also created an internal $20 million venture fund to finance electronic-business initiatives put forth by the company's various business units.

"Where we see e-business first having the biggest benefit is internally, making employees more efficient and effective," said Greg Vesey, vice president of electronic business.

To that end, Texaco has im-

Texaco, page 16

ERIC YANG

DUCKING THE HARD ISSUES

PRESIDENTIAL CANDIDATES GEORGE W. BUSH and Al Gore are happily soaking up campaign contributions from the IT industry.

But they aren't giving IT managers enough information about how they'll approach the thorny topics of information security and privacy, reports Washington senior editor Patrick Thibodeau (**page 4**). And in a special report, IT managers say they'd like to see a limited federal role regarding online privacy, e-commerce taxes and IT staffing.

Special Report

- IT leaders have a "don't tread on me" philosophy toward government. **Page 40**
- Gore and Bush agree on many IT issues, but Bush appointees might not be activists on antitrust. **Page 42**
- **Sound Off:** Should the H-1B visa cap be raised? **Page 46**
- Some companies support tax credits for IT training. **Page 48**
- What we know about the Echelon surveillance network. **Page 48**

NEWSPAPER

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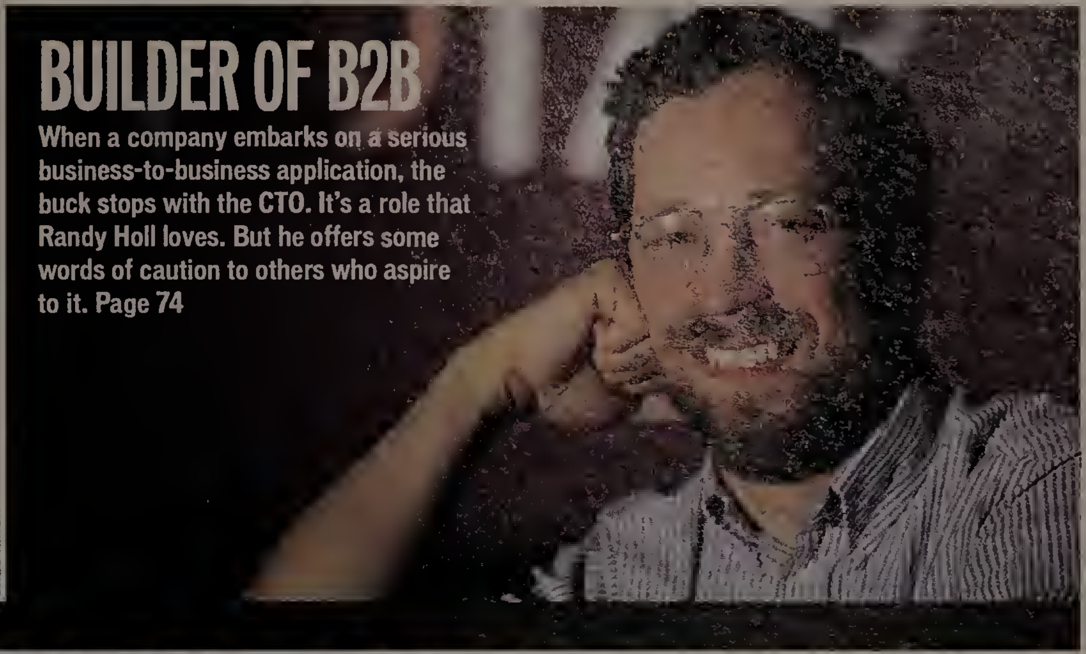
WINDOWS GOES GLASS-HOUSE

Users like Stephen Piazza (left) and Bruss K. Bowman are counting on big performance boosts from Windows 2000 Datacenter. Page 70



BUILDER OF B2B

When a company embarks on a serious business-to-business application, the buck stops with the CTO. It's a role that Randy Holl loves. But he offers some words of caution to others who aspire to it. Page 74

GREG KINCH

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AUGUST 28, 2000

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8 **HOSPITALS NEGLECT** efficient electronic-procurement services to avoid dealing with integration and management of new tech.

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16 **SPRINT LAUNCHES** a nationwide wireless network with virtual private nets, travel, e-mail and other services.

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SPECIAL REPORT

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52 **BEENZ.COM** is the home of *Real World London* cast member Neil Forrester. Find out what it's like to work there.

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59 **BETTER PERFORMANCE** tuning should result from new schemas, or database definitions, from the Distributed Management Task Force.

QUICKSTUDY

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66 **DETERMINING** that someone has been surfing porn sites is one thing; proving who did it is another. Our security manager investigates.

FUTURE WATCH

67 **DEVELOPERS WORK** on electronic replacements for ink and paper.

68 **IT'S ALMOST TIME** to say goodbye to that old security standby, the Data Encryption Standard. A replacement should be chosen by early fall.

This Week Online

- Have an opinion on government IT policies? Head to our special **Government Issues** forum, which you can find off our main forums page at *www.computerworld.com/forums*.
- For the latest news on legislation affecting IT, check out the **Watch on Washington** page at *www.computerworld.com/washington*.
- In our online communities, see the text of a speech by **Hewlett-Packard** CEO and President **Carly Fiorina** in which she said we are in the midst of a digital Renaissance and desperately need the help of a few latter-day Medicis and Machiavellis. *www.computerworld.com/security*
- And in the **E-Commerce Community**, one reader writes in a guest column that the recent flap about an erosion of privacy on the Web is more a symptom of "an immature industry" than an ominous plot. *www.computerworld.com/ecommerce*

OPINIONS

34 **MARK HALL** believes that with the Infiniband movement, we could give IT vendors a break from our usual suspicious views of their motives.

34 **DAN GILLMOR** writes that the race to control intellectual property could have major implications for the future, but no one is addressing them.

35 **DAVID MOSCHELLA** says the Internet may do for education what other information technologies could not.

36 **GEOFFREY JAMES** offers advice for IT professionals who are contemplating a leap into the dot-com world.

36 **MICHAEL GARTENBERG** shows how technology and fashion have collided, with vendors touting colors as well as speeds and feeds.

52 **JIM CHAMPY** says the New Economy may spawn new business principles, but don't junk the old ones.

86 **FRANK HAYES** observes that cyberspace vigilante groups such as EVAC and MAPS are walking on new legal ground, and corporate IT shops should tread carefully.

AT DEADLINE

Microsoft Pushes for Appeals Court Hearing

Microsoft Corp., in legal papers filed last week, renewed its opposition to sending its antitrust case directly to the U.S. Supreme Court.

"The need for soundness in the result outweighs the need for speed in reaching it," the company said in a brief filed with the court. The company, which wants the case to first be sent to the U.S. Court of Appeals, was responding to the federal government's earlier argument that the case was of "immense" importance to the national economy and too important to delay.

The government wants the Supreme Court to take the case up now. The high court may decide who will hear the case in as little as two months.

Deep Blue's Q Beats Larry and Scott

IBM's supercomputer Deep Blue, which beat chess master Garry Kasparov at his own game, has taken on heavyweight high-tech CEOs Larry Ellison and Scott McNealy in the fame game.

The computer, which recently guest-starred on the Fox TV program *Futurama*, is said to have a higher Q-Score than both executives. A Q-Score is the measurement of fame used by advertising agencies to determine the value of spokesmen or characters in promotional campaigns. Deep Blue had a Q rating of 8, while both CEOs lagged with 6. Elvis has a score of 33.

Short Takes

Internet investment firm **CMGI INC.** bought the naming rights for the new stadium being built for the New England Patriots in Foxboro, Mass. The 15-year deal requires Andover, Mass.-based CMGI to pay $7.6 million per year to the football team for the first 10 years, with payments to be adjusted for the remaining five years. . . . Job cuts at Internet companies in August rose 55% from July, according to outplacement firm **CHALLENGER, GRAY & CHRISTMAS INC.** in Chicago. From December through Aug. 23, layoffs totaled 11,785, up from 7,592 through July 23.

CIOs: Bush's, Gore's IT Plans a Mystery

Candidates may talk about issues, but IT managers say so far, it's all fluff

BY PATRICK THIBODEAU

THIS YEAR'S presidential election has brought with it a season of frustration for information technology managers, who say the candidates' platforms aren't telling them enough about what they would do as president regarding key issues that affect IT.

"Neither of [the candidates] really addresses the issues that I have to live in everyday," said Michael Smith, information systems director at Krack Corp., a maker of industrial refrigeration systems in Addison, Ill. "What do they really think about e-commerce and e-business and all the rest of those issues?"

Other topics IT managers said they would like more details about include the candidates' approaches to privacy, information security, the thorny issue of Internet tax collection by remote sellers and high-tech labor issues.

The privacy issue is "very important to all of us in the retail space," but there is a "cloud of haze" over both campaigns' approach to IT issues, said Mike Matheny, IT director at Cracker Barrel Old Country Store Inc., a Lebanon, Tenn.-based retail and restaurant chain.

Democratic candidate Vice President Al Gore and Republican Texas Gov. George W. Bush must explain how they plan to address workforce readiness and the so-called digital divide, issues both candidates said are important to them, said Thomas Conarty, CIO and a senior vice president at Bethlehem Steel Corp.

"The digital divide issue has a lot to do with how our shop-floor, high-school-educated worker is going to be able to embrace technology," said Conarty. "If that doesn't happen, I'm going to have to spend much more time providing fundamental education to entry-level employees just to get our work done."

Although both candidates have called for raising the H-1B visa cap, Conarty said he wonders what their specific plans are. If his Bethlehem, Pa.-based company can't use H-1B visas to hire foreign workers, he said, it will to turn to offshore software development.

BETHLEHEM STEEL CIO Thomas Conarty says he wonders about the candidates' plans for raising the H-1B visa cap

But one political expert, Wade Randlett, co-founder of the Technology Network, a bipartisan political action group in Silicon Valley, said some issues, such as privacy and taxation, are so ill-defined that not even privacy advocates are in agreement.

"To try to flesh out these very difficult things in the middle of a presidential campaign is a disaster waiting to happen," said Randlett, who is also vice president of Red Gorilla, a business application company in San Francisco.

A Democratic campaign official who asked to remain anonymous said that Gore has been specific on issues and has a record that includes attempts to strengthen safeguards on medical and financial data. Gore has also supported self-regulation for the e-commerce industry, the official said.

A Bush campaign technology adviser said he believes there's fundamentally little difference in the approach both parties are taking regarding high-tech issues. ▶

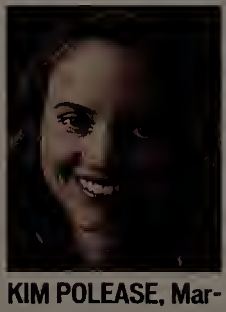
IT Lobbies Give Vendors Clout in Washington

Industry receives tax breaks and more

BY PATRICK THIBODEAU

High-tech firms have been pouring people and money into Washington, and they have been getting results: tax breaks and relatively little regulation of their activities.

In one year, from 1998 to 1999, lobbying expenditures for the computer industry jumped from $39 million to about $61 million — an increase of roughly 56%, according to Richard Delaney, president of The Delaney Policy Group in Washington.



KIM POLEASE, Marimba's co-founder: "We can't have our heads in the sand"

What did information technology vendors get for the money? Software and hardware makers, facing the threat of out-of-control Y2k-related litigation, successfully lobbied Congress to approve year 2000 liability-limiting legislation. Congress also approved a moratorium on new Internet taxes.

In terms of spending, high-tech industry lobbies now rival long-established lobbies like those of the insurance, tobacco and pharmaceutical industries, according to figures compiled by the Center for Responsive Politics, a nonprofit watchdog group in Washington. High-tech campaign spending this year is expected to exceed 1998 levels, which reached $9.4 million.

Microsoft has been the leader in high-tech campaign contributions, with more than $2.2 million coming from the company and its employees in this election season.

But in terms of campaign spending, the high-tech industry is still behind older industries. In 1998, the last election cycle, insurance companies contributed $31 million, oil and gas companies $22 million and telephone companies $14.8 million to political campaigns, according to Center for Responsive Politics figures. But not all firms approach such spending the same way.

Computer maker Gateway Inc. in San Diego, for instance, is taking a high-profile route in Washington. So far, Gateway is credited with contributing about $242,000 in political action committee and soft money donations to candidates and party organizations in this election cycle. The firm opened an office in Washington three years ago.

The company has a range of concerns, from taxation to the digital divide between those who have access to the Internet and those who don't, said John Spelich, a Gateway spokesman. "It would be foolish to just sit back and permit Washington to set policy on these issues without our voice being heard," he said.

In contrast, PeopleSoft Inc. in Pleasanton, Calif., doesn't have a political action committee, nor is it giving soft money. Instead, like many high-tech companies, PeopleSoft lobbies through trade groups like the Information Technology Association of America for industry representation, said company spokesman Steve Swasey.

But Delaney and other analysts said more companies are listening to people like Mountain View, Calif.-based Marimba Inc. co-founder and chief strategy officer Kim Polese, who said: "We have to be engaged in the process. We can't have our heads in the sand as we used to in the industry." ▶

MORE THIS ISSUE

Learn more about IT campaign spending and government issues in the Special Report starting on **page 40.**

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Online Vehicle Broker CarOrder.com Stalls

Struggling dot-com plans to come back as a click-and-mortar auto dealership

BY LEE COPELAND

CARORDER.COM Inc. shuttered its virtual doors, but the former online vehicle broker plans to reinvent itself as a click-and-mortar automobile dealership, officials said.

After two years of slow sales, CarOrder.com discovered that "operating a car brokering business [was] not a viable path to profitability," according to a spokeswoman for the firm. The Austin, Texas, start-up ceased selling cars less than two weeks ago, but it already has a backup plan and money in the bank to fund it. However, analysts said, the company has a bumpy road ahead.

CarOrder.com now plans to operate a car dealership using its Web know-how and technology to streamline consumer car shopping and dealership management. In addition to closing its Web business, in the past month the company also completed a $25 million second round of financing from parent company Trilogy Software Inc., also in Austin, Texas, and trimmed its employee rolls from 140 to 40.

But even with a $25 million cash infusion, analysts doubt whether CarOrder.com could muscle into the well-entrenched auto retail channel.

"It's an uphill battle, especially coming off such extensive layoffs," said Robert DeSisto, an analyst at Gartner Group Inc. in Stamford, Conn. "Fundamentally, they did not take into account the fixed costs of operating the business, which is typical of a lot of dot-coms."

DeSisto said because the margins on vehicle sales aren't enough to sustain a successful car dealership, CarOrder.com will have to offer services such as vehicle repairs in its new incarnation. "[Dealers] must adapt to services to be more profitable," DeSisto said. "So it defeats the purpose of being a pure dot-com play."

Last year, CarOrder.com attempted to acquire an auto dealership but was unsuccessful.

"One of the problems with dot-coms is that it is difficult to sell cars without a physical presence," said Rob Leathern, an analyst at Jupiter Communications Inc. in New York. "They are trying to change a convoluted system, governed by different legislation in each state. It's difficult to imagine them pulling it all together."

DeSisto noted that automakers control franchise licensing and may be reluctant to sell a license to a dot-com company.

Headed by President Brian Stafford, CarOrder.com has no plans to sell its software to dealerships, officials said.

Competing Web-based vehicle brokers have reported growing sales. For example, Autobytel.com Inc. in Irvine, Calif., reported second-quarter revenue of $17 million, an increase of 86% over the same quarter last year. Still, the start-up posted a net loss of $9.8 million, or 46 cents per share, for that quarter. ◗

Milestones

CarOrder.com hopes a cash infusion will fuel its transformation into a click-and-mortar car dealer.

- Launched in January last year with **$50M** in cash and **$50M** in licensed technology from parent Trilogy Software
- Laid off **100 of 140** employees in the past month
- Recently closed **$25M** in second-round financing to fund new business plan
- Shut cyberdoors **Aug. 18**

Amazon Has Greenlight In Online Marketing Deal

Book giant links with car-buying service

BY LEE COPELAND

With new funding in hand, online car-buying service Greenlight.com in San Mateo, Calif., last week unveiled a marketing deal with Amazon.com Inc. But analysts voiced doubts as to whether online vehicle brokers can bypass recent Web endeavors and obstacles set up by the automakers themselves.

Greenlight recently closed $39 million in third-round funding — money it hopes will fuel an expansion from 27 to 100 regional markets by year's end. Founded in August last year, Greenlight lets shoppers configure and price vehicles online and then connects customers to dealers to fulfill orders.

But automakers such as General Motors Corp. in Detroit want to reclaim their role as the top liaison to consumers. Two weeks ago, GM formed a Web firm with its dealers to build a multibrand car-shopping site [News, Aug. 21]. In an earlier bid to protect their turf, GM and Dearborn, Mich.-based Ford Motor Co. sent out letters last spring warning more than 12,000 dealers that they would lose rebates and incentives if they worked with Internet brokers.

Jim Hall, an analyst at AutoPacific Inc. in Tustin, Calif., said Web initiatives, legal hurdles and the recent closure of rival broker CarOrder.com (see story, above) in Austin, Texas, puts the success of online vehicle brokers in doubt.

"[Online car brokers] are competing with manufacturers and a lot of other people out there," Hall said. "They are going sideways against state franchise laws. There aren't any state laws regulating book sales, but there are plenty when it comes to cars."

But Joel Manby, CEO of Greenlight, said the company continues to grow its dealer-fulfillment channel, which includes more than 1,500 dealers.

Greenlight also has a flexible business model that can adapt to local franchise laws, he said. "There are 50 different ways of doing things in 50 different states," said Manby. "Our business model will vary state by state."

Greenlight also hopes marketing ties with Seattle-based Amazon will spur sales.

Amazon began linking to *www.greenlight.com* last week. In February, the companies struck a five-year deal that required Greenlight to pay Amazon $82.5 million for marketing and promotional services. Last week, the firms restructured the deal to a payment of $15.25 million by Greenlight to Amazon over two years.

The deal reflects tougher market conditions for dot-coms and gives Amazon a lower strike price on warrants to purchase up to 30% of Greenlight. Amazon purchased 5% of the car broker in January and contributed less than $5 million to the latest round of funding. ◗

AMAZON CEO JEFF BEZOS (left) and Greenlight CEO Joel Manby still face tough competition from brick-and-mortar companies

Goodrich Debuts B2B Site

BY JULIA KING

The BFGoodrich Co. will make its initial foray into the electronic-business arena in October, when its Performance Materials division launches a business-to-business e-commerce Web site for customers of its specialty chemicals, plastics, additives and other products.

The new Internet ordering system, which uses software from SpaceWorks Inc. in Rockville, Md., will first be available to 20 pilot customers. Rollout to customers in Europe and Asia is scheduled for next year.

"The new e-business software will give our customers another mechanism to buy products. They won't have to call customer service," said Todd Nelson, director of global information technology at the Cleveland-based division.

The firm also plans to offer different classes of electronic-business services to customers, Nelson said. For example, the most strategic customers will have access to warehousing information so they can figure shipping times and costs into their buying plans.

"There's also potential for revenue generation, since customers we don't reach today will be able to go to our Web site and place an order right there," Nelson said.

The industrial sector has been relatively slow to migrate sales and other business operations to the Internet, said Lisa Williams, an analyst at The Yankee Group in Boston.

The main reason, she said, is that industrial companies need to treat each of their customers uniquely and the software to do that on the Internet hasn't been widely available. ◗

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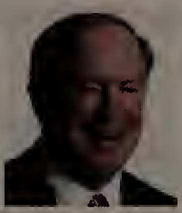

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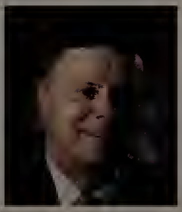

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BRIEFS

VA Linux Posts Strong Fourth Quarter

Linux systems vendor VA Linux Systems Inc. in Sunnyvale, Calif., impressed analysts with a strong showing in its fiscal fourth quarter ended July 28. Revenue, at $50.7 million, was up 547% compared with last year. "They blew away our numbers," said Prakesh Patel, an analyst at W. R. Hambrecht & Co. in San Francisco. Excluding acquisition-related costs and other noncash expenses, VA Linux lost 10 cents per share, 5 cents better than analysts had estimated.

Flaw Discovered in Encryption Software

A serious vulnerability has been discovered in Pretty Good Privacy (PGP) encryption software versions 5.x and 6.x that support key escrow in the form of Additional Decryption Keys (ADK). To stop an intruder from modifying the public key of a user's public/private PGP key pair after the public key has been used to generate ADKs, the additional keys must be signed with the private key as well. But the vulnerability allows public keys with nonsigned ADKs to be used. This means an intruder, with a copy of the user's public key, could add his own ADKs and fool someone into using this modified public key to intercept and decrypt encrypted communications.

Decimalization Begins

Wall Street begins its transition from fractional to decimal stock pricing this week. The International Securities Exchange said options on Gateway Inc. would begin trading in nickels this week. Other exchanges are expected to begin testing decimal-pricing programs this fall.

Short Takes

H. Ross Perot Sr. named his son, H. Ross Perot Jr., as the new president and CEO of his company, Dallas-based **PEROT SYSTEMS CORP.** . . . Ray Lane, who last month resigned as president and chief operating officer of **ORACLE CORP.**, has joined venture capital firm **KLEINER PERKINS CAUFIELD & BYERS** in Menlo Park, Calif., as a general partner.

Health Care Slowly Adopting E-Procurement

But some doubt value of 'overhyped' Web

BY JULEKHA DASH

LOADS OF electronic-procurement firms are targeting health care. But despite the promise of improved efficiency, few hospitals want to struggle with the integration burden, and others say they doubt there will be any savings in the new approach.

In a study released last week, Sandy Lutz, associate director of health care research at New York-based PricewaterhouseCoopers, estimated that there are 50 to 70 electronic-procurement companies targeting the health care industry.

But U.S. hospitals currently make less than 3% of their purchases online, according to Toronto-based Millennium Research Group (see chart).

On the Rise

Percentage of hospital purchasing managers ordering supplies online:

2000	2001	2003
2.6%	26.4%	64%

Base: 100 hospitals

SOURCE: MILLENNIUM RESEARCH GROUP

For years, most hospitals have ordered supplies ranging from office items to medical equipment through group purchasing organizations (GPOs). Acting as middlemen between health care providers and manufacturers, GPOs help negotiate volume discounts.

Other health care organizations buy direct. Greg Walton, CIO at Carilion Health System in Roanoke, Va., said he prefers to order supplies from manufacturers and hasn't seen much value from electronic-procurement firms.

"The Web is overhyped," said Walton.

Hospitals are often locked into long-term purchasing contracts and can't simply change their ordering systems overnight, according to Mark Anderson, a vice president at Stamford, Conn.-based Meta Group Inc. and a former hospital CIO. That's why doctors' offices have caught on to electronic procurement more quickly than hospitals, said Anderson.

But health care is warming up to placing orders online. Hospital purchasing managers say that more than one quarter of their transactions will be conducted online by next year, and about two-thirds by 2003, according to Millennium Research.

Consider the Savings

Diane Zak, a purchasing manager at Talbert Medical Group in Costa Mesa, Calif., said online ordering will save the group time and money over the current handwritten purchase orders and Excel spreadsheets.

Talbert last week signed a three-year contract with Irvine, Calif.-based Embion Inc., which will work with Talbert's suppliers to move all of Talbert's purchases online. Zak says she hopes the process will be completed by next April. ▶

Online Back-to-School Shoppers on the Rise

BY CAROL SLIWA

The school-shopping rush may not be creating online traffic jams, but some multichannel retailers are finding that somewhat effort-free promotions can provide welcome relief from the summer doldrums.

L. L. Bean Inc.'s Web site tells visitors that "school is cool," but the back-to-school push actually has been hot for the Freeport, Maine-based retailer. Andy Sturm, marketing manager for L. L. Bean's kids' division, said the site has seen more than 100% growth in revenue and visitors, compared with last year, after promoting school items only through e-mail and catalogs.

"It's definitely been way beyond what, by any reasonable projection, we would have expected based on the patterns we'd seen before," Sturm said, noting that the online surge is in line with rising catalog sales.

While every site may not be witnessing a growth spurt like that of L. L. Bean, polls have indicated that more parents and children are shopping online for the upcoming school year than in the past.

In a telephone survey of 1,002 adults conducted in July by Myvesta.org, a nonprofit organization in Gaithersburg, Md., and financed by Capital One Financial Corp. in Falls Church, Va., 51.6% of back-to-school shoppers said they expect to browse on the Internet, and about half of them (25.5%) said they expect to make at least one purchase online.

A poll released in late July by American Express Co. in New York showed far more modest numbers but also predicted that the number of online back-to-school shoppers would triple from last year.

Of 1,000 randomly selected adults, 90 (9%) said they would shop or browse online, vs. just 3% a year ago. Of 500 teen-agers surveyed, 12% said they would shop or browse, compared with 4% last year.

Those numbers are hardly staggering, particularly compared with overall retail shopping figures and even holiday online buying patterns. But "it shows momentum," said American Express spokeswoman Joanne Fisher, who attributed the low numbers to shoppers' reluctance to purchase clothes and shoes online.

But that trend may be starting to shift "a little bit," according to Jupiter Communications Inc. analyst Heather Dougherty. One recent survey conducted by New York-based Jupiter showed that 38% of 1,928 online shoppers surveyed bought apparel over the Internet in the past year. Chief barriers cited were an inability to try on clothes and to see items well.

"Retailers are definitely trying to get around this," said Dougherty, noting that more sites now offer enlarged photo and 3-D image options.

Retailers such as Troy, Mich.-based Kmart Corp.'s Bluelight.com LLC and San Francisco-based The Gap Inc. have noted promising returns from the parts of their sites devoted to school uniform sales.

Dave Chambers, director of customer relationship development at Bluelight.com, said, "If you can't see it and touch it, you'd better have a good return policy." He said customers can return items to more than 2,000 Kmart stores.

Where's the Mall?

Some of the reasons people cite for not shopping online for back-to-school products:

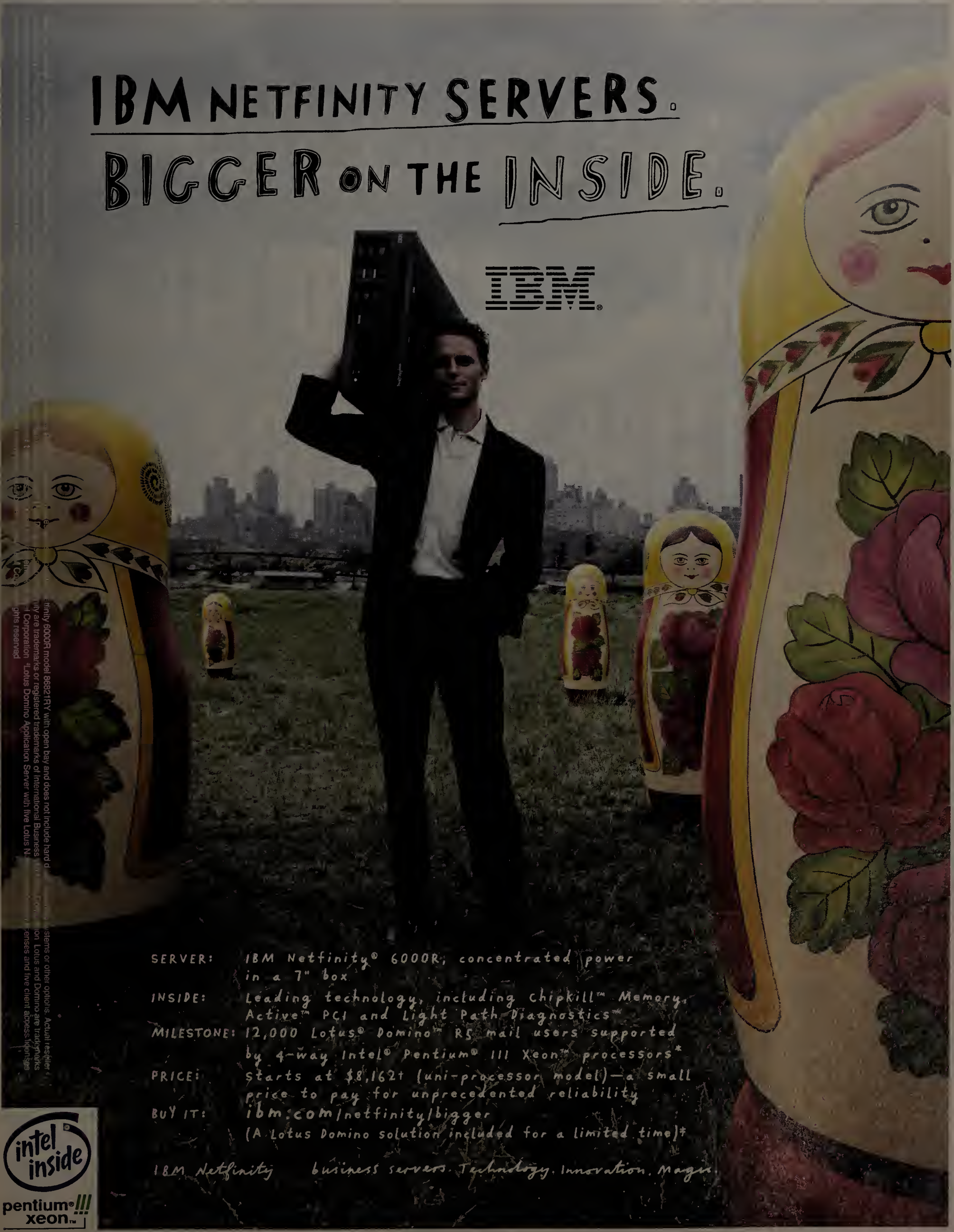
SECURITY	
Parents	40%
Teens	20%
SHIPPING COST	
Parents	30%
Teens	15%
PRIVACY ISSUES	
Parents	27%
Teens	12%

Base: 1,000 adults and 500 teen-agers.

SOURCE: AMERICAN EXPRESS CO. RETAIL INDEX

Chambers said Bluelight expects back-to-school shopping to be a major part of its online retail business since it piggybacks off Kmart school promotions featured in 72 million Sunday newspaper inserts.

"If you're in retailing and tied with a mass merchandiser like Kmart, it makes sense to follow their merchandising themes," Chambers said. ▶



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Gupta Named CTO at Computer Associates

BY SAMI LAIS

The top-level reorganization at Computer Associates International Inc. continues this month with the appointment of 11-year CA veteran Yogesh Gupta as chief technology officer, said a spokesman for the Islandia, N.Y.-based company.

Gupta replaces former CTO Nancy Li. She will become CEO of iCan-ASP Inc., a new company formed by CA to supply software and services to application service provider (ASP) businesses.

CA founder and Chairman Charles B. Wang this month ceded his CEO title to Sanjay Kumar, CA's president and former chief operating officer. Wang will "devote his energies to new ventures," including iCan-ASP, CA said in a written statement.

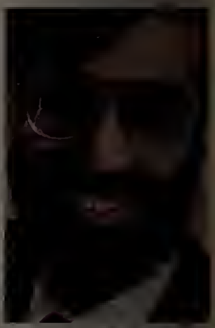
Filling a Familiar Role

The change in Wang's title merely makes de jure what has been de facto, said Patrick Dryden, a longtime CA watcher and an analyst at Illuminata Inc. in Nashua, N.H.

"For a while now, Sanjay Kumar has been running the show day to day," Dryden said.

"If you look at all the examples of [businesses developing Web sites] using Jasmine ii [CA's e-business platform and application development software], you'll see Charles Wang was involved in those," said Dryden. "This just frees him to take on more of those things."

A deal maker like Wang will be needed in a market heating up as fast as the ASP market is, said Dryden, adding that Hewlett-Packard Co. has been moving into that market "for at least a year and a half."



GUPTA will bri 11 years of experience at CA to the CTO

CA said this is the first of several anticipated spin-offs, which include businesses to sell its desktop and Accpac accounting software.

Gupta was named senior vice president of e-business strategy at CA last year in time to help drive the launch of Jasmine ii.

As senior vice president for product strategy, a post he held until last year, Gupta also played a key role in the development and launch of Unicenter TNG, CA's systems management framework software, according to a CA spokesman.

Wang has further raided CA's management ranks to fill the roster of officers for iCan-ASP, and that could present problems, Dryden said. If CA continues to populate new divisions with existing development staff, "it could be taking away from future development" of existing products, he said. "It's a watching point for users."

No replacement has been named to the chief operating officer slot vacated by Kumar, and the company is uncertain whether the slot will be filled, a CA spokesperson said. ◗

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BRIEFS

GE to Invest in Railroad Marketplace

General Electric Co. in Fairfield, Conn., has signed a letter of intent to become an investor in Fort Worth, Texas-based FreightWise Inc., the Internet freight transportation marketplace created last October by Burlington Northern Santa Fe Railway Corp., also in Fort Worth. The two companies haven't released details of the agreement, which they expect to finalize at the end of next month. The Freightwise Web site will link buyers and sellers of truckload and intermodal transportation, allowing them to participate in auctions and allowing shippers to buy transportation capacity.

Consultant Charged in Parametric Scheme

A Florida man has been charged with extortion after he allegedly threatened to release the master "keys" to run Parametric Technology Corp. software unless the company paid him more than $1 million, the office of the U.S. attorney for Massachusetts said last week. Michael Pitelis, 39, of Tarpon Springs, Fla., allegedly sent an e-mail Aug. 3 to Parametric CEO Richard Harrison asking what would happen if the installation instructions for the company's Pro/Engineer software package were released to Pro/Engineer bulletin and news boards. The remainder of his message allegedly detailed how to install the software.

NSI to Test Multilingual Domain Names

Domain registrar Network Solutions Inc. in Herndon, Va., said last week it will start a test program that will allow registration of multilingual domain names in 55 languages and character sets through the 60 or more registrars accredited by the Internet Corporation for Assigned Names and Numbers in Marina del Rey, Calif. I-DNS.net International Inc. in Palo Alto, Calif., which developed a system to recognize non-ASCII characters, will supply the technology for the test. Among the languages that will be supported are Japanese, Chinese, Korean, Arabic and Hebrew.

Police Arrest E-Bank Robbery Suspects

U.K. officials use software to investigate alleged fraud at Egg, other online banks

BY MARIA TROMBLY

BRITISH POLICE arrested three men last week who allegedly attempted to rob an online bank, London-based Egg PLC.

According to the bank, the arrests came after a six-month investigation in which the bank worked with the police to set up an electronic trap.

"We installed a piece of software that enabled us to identify these people," said Egg spokeswoman Poppy Nagra. "No customers lost money. There was no breach of security. It was very much a proactive security exercise for us."

Egg, the online banking offering from Prudential PLC, has 1.1 million customers.

Other Internet banks may have also been targeted, police said.

Online banks could draw a lesson from this, said Richard Bell, an analyst at Needham, Mass.-based TowerGroup.

"Banks have got to protect themselves in the Internet arena just as they have in the real world from all the fraud," he said. "This is a classic fraud."

The men made mistakes and got caught, he added, but the next group of thieves may learn from those mistakes.

Loopholes Invite Robbers

Bret Sigillo, regional director of information security at New York-based Predictive Systems Inc., said banks should review their software to close loopholes. Common loopholes are those that give customers access to other customers' accounts.

Another major security problem, he said, is the fact that an online bank has a more difficult time verifying the identity of someone who wants to open an account. In a physical branch, a bank officer can ask for photo identification.

For an online bank, the only solution is digital authentication — something that won't go into widespread use on the consumer side for at least two years.

The three men arrested were deliberately targeting online banks, according to a statement from Det. Sgt. Mick Randall. Police wouldn't release the names of the other banks affected, but they said they were investigating.

The attempted fraud was the first case of its kind for Egg, Nagra said, and is the first publicized instance for the Internet banking industry.

But that doesn't mean it hasn't happened, said Sigillo.

"It's usualy not in a bank's best interest to notify the public that something like this has happened," he said. Publicity about a bank's security problems can make customers hesitant about opening accounts at that particular bank, he explained.

To Catch a Thief

EGG'S SECURITY PROBLEM:
A customer could submit multiple credit-card and bank-loan applications from one account.

SOLUTION:
New software to monitor the problem and catch the would-be robbers.

SOURCE: EGG PLC, LONDON

No Customers Affected

In the Egg case, no customer accounts were affected. Nagra said the alleged con men attempted to fraudulently open credit-card accounts and apply for bank loans. She said she couldn't elaborate because the case is still being investigated.

According to the National Crime Squad, the three men, all in their 30s, live in Buckinghamshire, Bedfordshire and Northamptonshire, counties surrounding London. They used a security loophole at Egg that allowed users to open multiple accounts using the same user information, police said.

The three were released on bail last Wednesday, police said. ▶

Troubled Drkoop.com Is Barely Breathing

Despite new cash, analysts say site has a bleak future

BY KATHLEEN OHLSON

Drkoop.com Inc. came back from the brink of death last week, but analysts said its prognosis is bleak.

Prime Ventures LLC, J. F. Shea Co., Cramer Rosenthal McGlynn LLC and other investors injected $20 million in equity last Tuesday, only hours after the troubled Internet health company said it had run ran out of cash.

Drkoop.com had stayed afloat until then through a $3 million credit line from Commonwealth Associates, a New York-based venture capital and merchant banking firm.

Some of these investors, led by Prime Ventures executive and former Excite@Home executive Richard Rosenblatt, took over Drkoop's management last week.

Analysts said last week's rescue won't sustain Drkoop's operations for long. "They've been looking for a buyer for months, and [$20 million] will salvage them for a little while," said Rachel Terrace, an analyst at Jupiter Communications Inc. in New York.

The Austin, Texas-based company lost $40.6 million for the second quarter ended June 30, while posting $2.5 million in advertising, licensing and sponsorship sales.

Analysts attributed Drkoop's woes to its business model. The site offers only information about health content, and "content is no longer 'in,' " said Catherine Monaghan, an analyst at Gomez Advisors Inc. in Lincoln, Mass.

Drkoop didn't diversify its model into partnerships, counting instead on advertising and sponsorship from pharmaceutical companies, which didn't materialize, Monaghan said.

The company, which was founded by former Surgeon General C. Everett Koop, spent $45.5 million on sales and marketing last year and has pumped in another $44 million so far this year.

On top of its financial woes, Drkoop disclosed last week that the Securities and Exchange Commission is investigating the company for alleged insider trading by Koop and other company executives.

The investigation stems from shareholder suits charging that Koop and others withheld a poor auditors report until they sold their shares in February.

DRKOOP.COM'S shareholder suits have led to a probe involving C. Everett Koop, former U.S. surgeon general

Survival Strategy

Elizabeth Boehm, an analyst at Forrester Research Inc. in Cambridge, Mass., said Drkoop may survive by revamping its strategy quickly. Help could come from the new management team led by Rosenblatt. Koop remains as a board member and chairman.

But Monaghan and Terrace said the new management will prepare Drkoop for a buyout. Likely suitors are health insurance or managed-care organizations that want to bolster their site content, they said.

Drkoop said it's pursuing additional funding and declined further comment. ▶

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H-1B Fees Pay for High-Tech Training

Labor Department routes $80 million in grants to local governments for programs

BY JULEKHA DASH

DOZENS OF local high-tech training initiatives will receive more than $80 million this year from the U.S. Department of Labor, which is awarding money generated from a visa program popular in high-tech.

The money won't solve all of the industry's labor woes, analysts said, but the grants will help develop the talent that the information technology industry needs, such as Web programming and database administration.

The government realizes that the technical skills shortage is an "inhibiting factor to growth" for many companies, said Barbara Gomolski, research director at Gartner Institute in Eden Prairie, Minn.

The department is awarding money primarily to coalitions that oversee workforce development and involve both the public and private sectors. Using a portion of the $500 fee that foreign workers pay when they apply for an H-1B visa, the federal agency has awarded about half of the money thus far and plans to award the rest by October.

The San Francisco City Private Industry Council Inc. will use its grant to fund seven months of training for 250 individuals, many of whom are low-income citizens and minorities, who will be trained in areas like technical support, Web design and systems administration, said Pamela Calloway, the council's president. Local organizations, such as Goodwill Industries and the Bay Area Video Coalition, will provide training and placement services.

The council was one of 12 organizations that received $2 million to $3 million from the Labor Department during a recent round of funding. The department said it expects the $29 million awarded last month to pay for the training of more than 5,000 workers.

The government's selection criteria for training projects included sustainability, cost effectiveness and the involvement of community organizations through partnerships.

Selected employers in the Baltimore area will receive money for training in database development, systems integration and network design, said Lisa Scott, a senior program specialist for Baltimore County, which was recently awarded a $2.5 million grant. Firms can select the training provider and delivery method, she said. About half of the money will be used to train employers' existing workers, and the rest will go toward training unemployed and non-IT workers for entry-level positions. Employers will commit to hiring those workers after the training.

The county plans to use an assessment tool to determine if unemployed workers have the skills to enter high-tech jobs; details of the project are being worked out, said Scott.

When the Labor Department's training dollars dry up, Calloway said, she hopes to have "honed the ability to connect those job seekers who are unskilled to skilled labor positions." She also said her organization may be able to attract more training money from other public and private sources.

Sustaining a training program is key for it to have a lasting impact, said Cushing Anderson, a program manager at International Data Corp. in Framingham, Mass. "The need for high-tech workers isn't going to diminish; it will accelerate. You still need to fill the pipeline every year," he said. ◗

Continued from page 1

Sun Problem

The nondisclosure agreements were apparently offered with a claim that signing them would bolster Sun's commitment to resolving the problem quickly, Henkel said. Sun customers began reporting the problem as long as 18 months ago, he said.

Shoemaker last week acknowledged that it may have been a bad idea for Sun to get its users to sign nondisclosure agreements. But he said the company took that measure only because Sun itself was struggling to pinpoint a reason for the system failures. He added that Sun has stopped requiring such agreements.

The long-standing nature of the problem and Sun's handling of the issue raise troubling questions about the quality of Sun's hardware and support, Henkel said.

One high-profile customer that has had very public problems with Sun hardware is eBay Inc. The online auctioneer has suffered a series of hardware-related outages over the past year, including one last week. It is unclear whether eBay's problems are related to the memory issue, however.

Fight Back

Gartner Group's recommendations for Sun users who encounter the chip problem:

- **Challenge Sun's claims of site environmental factors:** While poor operating conditions may contribute to the problem, a majority of the reliability issues aren't environmental in nature.
- **Involve Sun corporate engineering resources:** Try to engage senior-level corporate engineering resources to assist with reliability-related problem diagnosis and resolution.
- **Demand a documented plan for problem resolution:** Ask Sun to establish a long-term, mutually agreeable program for resolution of reliability problems.
- **Reject Sun's demands for blanket nondisclosure agreement.**

Gartner plans soon to release an advisory on the memory component issue, updating one released in November, because of continued and "frequent client complaints of persistent downtime" caused by the problem.

Sun insisted last week that the problem hasn't caused any data loss for customers. But the frequency of reboots disrupts availability and can cause data loss if applications don't restart properly, users said.

In the past year, Henkel said, he has talked with at least 50 Sun customers who complained of hardware reliability issues caused by defective memory. Systems affected by the problem appear to be those based on 400-MHz UltraSPARC-II CPU modules using either a 4MB or 8MB cache.

"There are a lot of very unhappy campers out there," Henkel said. "Sun has been experimenting for too long now to find a solution to this problem."

Meta Group Inc. in Stamford, Conn., also has clients that have experienced the problem.

"There was a rash of reliability issues relating to this problem in the March-to-April time frame," though none since then, said Meta Group analyst Brian Richardson. Eight out of 20 of Meta's large Sun accounts reported the problem, Richardson said.

According to Shoemaker, the issue has triggered a massive overhaul of Sun's quality processes and has already directly resulted in about eight major hardware and software changes being incorporated into Sun's Ultra Enterprise server line.

Sun has also put in place far more rigorous quality and availability testing of its products and is mandating more stringent audits of customer sites, environmental conditions and planned configurations before taking orders on its high-end servers, Shoemaker said.

By year's end, Sun will release a mirrored memory module that should address this issue once and for all, Shoemaker added. In the past several months, Sun has also been in direct contact with the CIOs at several of the affected companies to explain Sun's new quality initiative, he said.

"This has been a watershed event for Sun," Shoemaker said, adding that the company has moved from the back of the class to class leader with respect to quality.

But according to an MIS manager in North Carolina who has experienced the memory problem and who spoke on condition of anonymity, Sun has offered no explanation for the problems. "Sun has not disclosed any information to me about their memory issues — not even a brief description," the manager said.

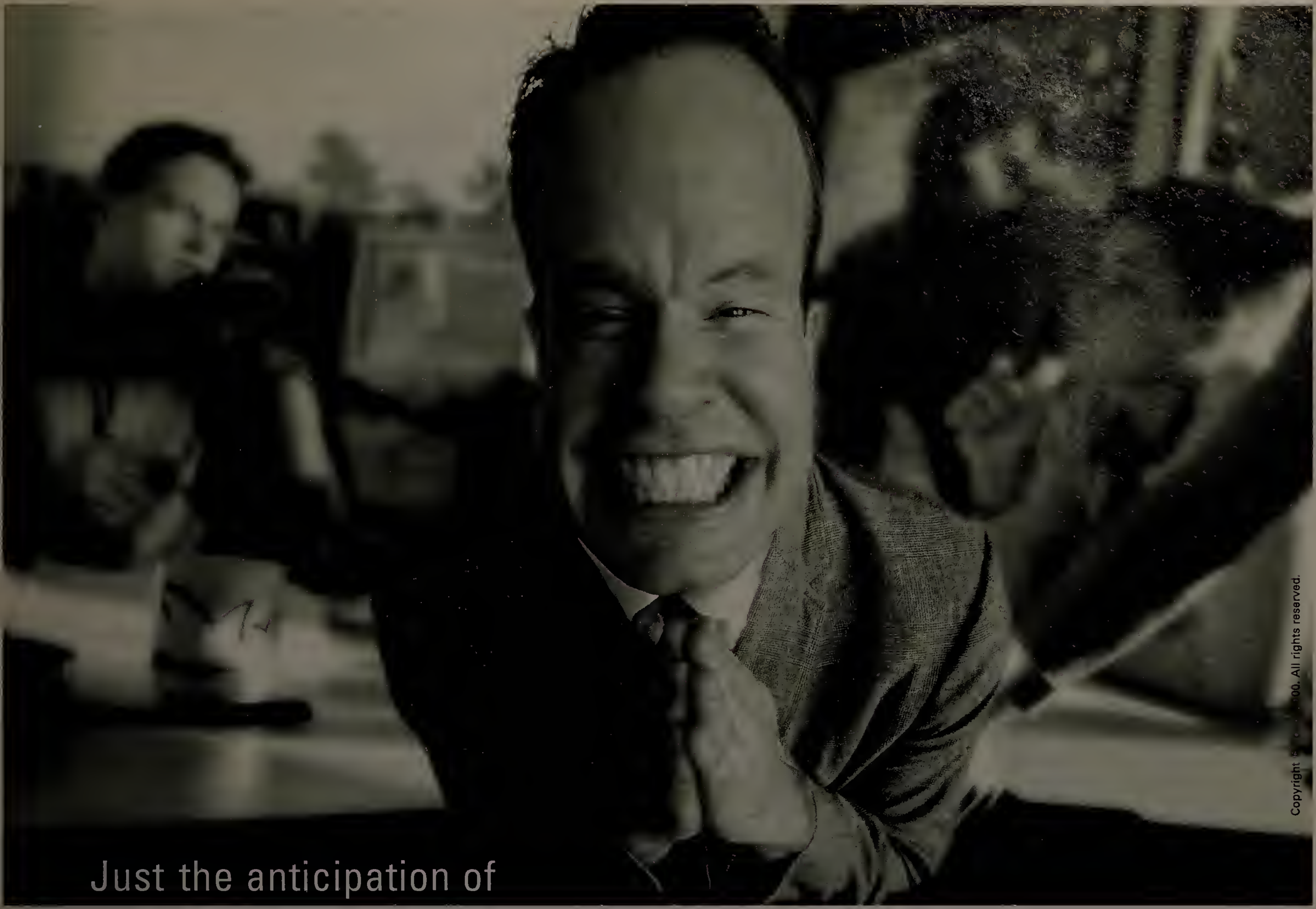
In the past three months, all of the manager's six Sun servers have crashed because of memory-related problems, he said. In each instance, Sun swapped out entire CPU modules but offered no explanation for doing so, he said.

A user at a Midwestern manufacturing company, who also spoke on condition of anonymity, had a similar experience.

"As soon as we reported the issue to Sun, the affected processors were replaced under service contract," he said. The company was able to resolve the problem by rearranging "our data center with the express purpose of lowering system temperatures," he said. "The systems run 10 to 15 degrees Fahrenheit cooler than before, and we haven't seen a problem since."

According to Shoemaker, Sun hasn't been able to narrow the problem to any one specific cause. Sun believes the problems may have been caused by a combination of factors, including defective components from one of Sun's suppliers, poor packaging of the memory chips on the system boards and environmental factors. ◗

Meghan Holohan contributed to this report.



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Sprint Pushes Into Corporate Wireless

Offers one-stop access to services, hardware

BY BOB BREWIN

SPRINT PCS GROUP rolled out a suite of wireless services and products for corporate users, including access to Microsoft Exchange and Lotus Notes e-mail, corporate travel sites and sales force automation tools.

Analysts viewed the new service as a logical move to provide corporate customers with a one-stop-shopping approach to enterprise wireless Web offerings, while a spokesman for rival AT&T Wireless Group in Redmond, Wash., called it a "ho-hum" announcement of services widely available from other carriers.

"We have been serving the enterprise market since 1996 and have hundreds of corporate customers and have been providing them with access to the same kind of information," said AT&T Wireless spokesman Ken Woo. As examples, he cited AT&T's agreements with Lotus Development Corp. and Sabre Inc. to provide wireless Web offerings to corporate customers through its PocketNet service.

The new Sprint PCS services, called Wireless Web for Business, include wireless links to corporate travel departments provided by Sabre in Fort Worth, Texas; sales and field service applications from Siebel Systems Inc. in San Mateo, Calif.; and corporate directory services from PeopleSoft Inc. in Pleasanton, Calif.

AT A GLANCE

Wireless Web Goes Corporate

Highlights of Sprint PCS Wireless Web for Business:

- Supports behind-the-firewall enterprise e-mail based on Exchange or Notes
- Provides corporate travel services through Sabre
- Offers corporate directory services through PeopleSoft
- Supplies sales and field service support with Siebel Systems
- Offers access with two new modems
- Supports wireless VPNs

Kansas City, Mo.-based Sprint PCS plans to offer the service to business customers who have already signed up for a monthly $49.95 bulk-rate plan. They can choose unlimited access to the wireless Web service for an additional $40 or, for an extra $10 per month, they can allocate airtime between voice and data services, according to Sprint.

Sprint PCS will also offer enterprise customers the ability to establish wireless virtual private networks (VPN). Sprint spokeswoman Kami Jowers declined to disclose pricing details but indicated that VPN service would carry a price tag in the tens of thousands of dollars per month.

Sprint also introduced two wireless modems that company officials said would provide faster access — 56K bit/sec. — than the current wireless or wired dial-up services offered by Sprint.

But Ken Dulaney, an analyst at Stamford, Conn.-based Gartner Group Inc., said Sprint PCS "went overboard on the hype" about the 56K claim. Dulaney said the company bases the claim on performance enhancement derived from the use of a compression technology from BlueKite.Com in San Francisco to improve the throughput of data traffic over the Sprint PCS network's 14.4K bit/sec. wireless links.

Ron LeMay, interim president of Sprint PCS, said the new package of business wireless Web services is a response to growth in corporate demand for wireless access to information that Sprint has seen since the company introduced wireless Web service a year ago. LeMay said that in the past year, wireless national business accounts have grown 285%.

Tim Scannell, a Quincy, Mass.-based analyst at Mobile Insights Inc., said he viewed the new Sprint PCS business wireless Web offerings as "basically a partnership for corporate customers who don't want to go to multiple sources for services. . . . This will make wireless less confusing for business customers."

But another Sprint rival, Verizon Wireless, also played down the new offerings.

A spokeswoman for Bedminster, N.J.-based Verizon said she is prohibited from commenting about plans to serve the corporate market because of a pending initial public offering. But, she added, "in the next few months, you will see Sprint is not unique in this marketplace." ◗

Lotus Expands Wireless in Sprint Deal

In an effort to move beyond the "one-trick pony" image of messaging services, Lotus Development is partnering with Sprint PCS to offer wireless applications through Sprint's new Wireless Web for Business service.

Lotus also plans to announce new portal offerings with an emphasis on knowledge management at its conference, Lotusphere, in Berlin next month.

This week's announcement of wireless access to Notes through Sprint PCS is expanding on Lotus' forte, said Amy Reuss Caton, senior brand marketing manager at Notes. The service provides Notes users with access to e-mail, calendar and corporate directories.

But Lotus also hopes to link other applications to the wireless service so that more information can be accessed through the database.

However, Patrick Bodin, manager of research and development at Allied Automotive Group Inc. in Decatur, Ga., said he isn't waiting around for Lotus to create access to applications.

"I can do all my own database stuff," he said. Allied has used Mobile Notes for about six months with wireless technology from Veriprise Wireless Corp. in Alpharetta, Ga.

The collaboration with Sprint doesn't mean it is an exclusive deal. The same Mobile Notes and Mobile Services for Domino technology also works with AT&T Corp. wireless services and could work with New York-based Verizon Communications cellular phones. Lotus, however, doesn't have any type of cooperative agreement with Verizon, so the user would have to set up the services independently.

– Jennifer DiSabatino

Continued from page 1

Texaco

plemented an extensive intranet application, known as PeopleNet, that functions as a giant worldwide knowledge base for far-flung workers.

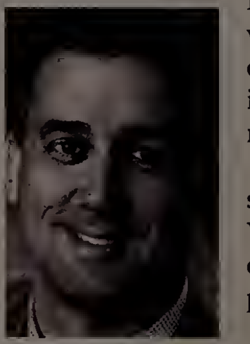
"What we're trying to create are communities of people with like skills sets around the globe," Vesey said. "If there is a deepwater driller in the Nigerian business unit and another deepwater driller in Brazil, they can transfer technology and knowledge."

Texaco is also working with consultants from PricewaterhouseCoopers to implement buy-side procurement software from Ariba Inc. Vesey said he expects that project to be completed by the end of the year and to cut procurement costs "substantially" by giving the company a much more accurate picture of inventory already on hand.

"If a person has to order drill pipe, the system will first look at the entire Texaco inventory around the globe to see if and where it is available," he explained. If inventory is available, the system will calculate the cost of shipping and insurance, then compare those costs to the cost of buying pipe at an online marketplace.

Earlier this month, Texaco signed a two-year, $20 million contract with Red Sky, a New York-based Internet services firm that will deploy up to 60 information technology workers and e-commerce specialists to Texaco's White Plains headquarters and its IT arm in Houston.

The contract represents as many as 20 e-business projects, according to Howard Belk, president of Red Sky. Among these is an Internet-based procurement system at Texaco's marine and aviation fuel division, which provides fuel to large shipping companies whose equipment is scattered around the globe.



GREG VESEY: creating "communities of peoples with like skills"

In addition to Red Sky, Texaco has contracted with several other technology and IT service providers — including IBM Global Services and Concert, the AT&T Corp. and British Telecommunications PLC global venture — that are working on various electronic-business initiatives that eventually will be introduced to all Texaco business units, Vesey said.

Texaco now employs about 450 IT workers, primarily in Houston. Going forward, it expects to outsource much of its electronic-business activities.

"It's an ever-shrinking number," Vesey said of the size of Texaco's IT department.

"Our theory with the Red Sky agreement was that we had to bring into Texaco people with New Economy thinking," he added.

Texaco is also a founding partner, along with Chevron Corp., of PetroCosm.com, a Houston-based online business-to-business exchange for the oil and gas industry.

"The newspaper articles have all been around Commerce One Inc.'s and Ariba's technology," Vesey said. "But that technology is just a small piece of an exchange. You also have customer relationship management software, collaboration tools and on and on. We almost look at our investment in PetroCosm as our way of paying for the new [electronic procurement] process."

Compared with other big oil companies, Texaco is neither a leader nor a laggard on the electronic-business front, analysts said.

"All of the big [oil] companies are involved one way or another with e-business and e-procurement," said Albert Anton, an oil industry analyst at Carl H. Pforzheimer & Co. in New York. ◗

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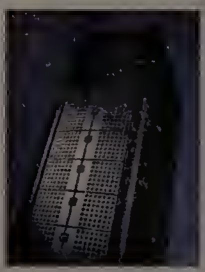

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Companies Turn to Portals for E-Business

Extending in-house business data seen as another way to generate Web-based sales

BY JULIA KING

ASK ABOUT enterprise portals, and most people describe sites that employees use to download corporate data stashed away in different computer systems. Think 401(k) statements and local weather forecasts.

But not Ahmad Atwan. For him, portals mean new revenue for Altra Energy Technologies Inc.

The Houston-based online energy exchange is using portal technology to launch a slew of Web-based services, such as deal-capture and risk-management applications, that could generate more sales than the exchange itself.

"Right now, we make our money from transaction fees," said Atwan, Altra's director of electronic business. "But we have much more energy software expertise that we can deliver, and the portal is the ultimate application hook we'll use to provide those new enabling technologies."

ATWAN will use portals as a 'hook'

The same goes for Bank One Corp., The Chase Manhattan Corp., Hyundai Group and Guess Inc., all of which are ahead of the curve in deploying portal frameworks to extend in-house business data and internal applications to paying, Web-based customers on the other side of the firewall.

Both Bank One and Chase are implementing San Francisco-based Epicentric Inc.'s portal server software to deliver Web-based tools for risk and credit analysis to commercial customers.

"Banks are positioned very well to be intermediaries," said Raechel Wright, director of electronic-delivery architecture at Bank One in Columbus, Ohio. Now, for example, the bank issues secure identifications to its own commercial customers. "But it could also be a service we provide" to a much broader audience, she said.

"The big value point with portals is they enable selected bits of enterprise data and reports, correspondence and other data to be displayed to external parties, without the need for any application integration outside," said Hadley Reynolds, an analyst at The Delphi Group in Boston.

With outward-facing portals, a small but growing number of companies are adding transaction capabilities.

"This is very much at the beginning of the curve," Reynolds said.

Other companies are creating such portals, not so much to generate revenue as to pare down operational costs.

Among them is Los Angeles-based apparel manufacturer Guess Inc., which is using San Francisco-based Plumtree Software's portal system to deliver online ordering capabilities and other information to 900 specialty retailers around the world.

One of the downsides to portal technology is that implementations can be long and tedious. Often, the lion's share of the work involves making up-front business decisions about exactly what to deliver through a portal, experts said.

"In a typical packaged application, you've got hundreds of processes. But in a portal-based e-business application, you need to provide access to only a small amount of those processes. Identifying which ones are the most important is a difficult task," said Gene Phifer, an analyst at Gartner Group Inc. in Stamford, Conn. ◗

Firm Unveils Technology To Cut Optical-Fiber Costs

BY JAMES COPE

Sending data over optical fiber for long distances normally requires electrical amplification along the way. But that regeneration hurdle and the costly maintenance associated with it may finally have been overcome.

Last week, officials at Broadwing Communications Inc. in Austin, Texas, said they had successfully tested a 10G bit/sec. all-optical network that looped 4,000 kilometers, from Phoenix to Fort Worth, Texas, and back.

The trial, according to Broadwing, proves the viability of an ultralong-haul fiber-optic transmission system from Corvis Corp. in Columbia, Md.

Optical wavelengths lose signal strength over long distances and ordinarily have to be regenerated — that is, converted to electrical signals, amplified and converted back to optical wavelengths — every 500 to 600 kilometers, according to experts. That requires technicians to physically upgrade bandwidth capacity on existing fiber cables at points along the way.

Through a proprietary all-optical amplification technology, the Corvis system can sustain an optical signal over longer distances without electrical conversion, company officials said. That, according to Ann Reidy, an analyst at telecommunications industry researcher RHK Inc. in San Francisco, could ultimately cut the time and costs associated with adding more channels to existing optical fiber.

Dale Richardson, Broadwing's director of engineering, said it took only a day or two to set up the 10G bit/sec. test loop based on the Corvis system. Using standard electrical-signal regeneration technologies, the same provisioning exercise could take up to six months, he said.

Steve Ellis, manager of telecommunications at the University of Notre Dame in Notre Dame, Ind., a Broadwing customer, said optical technologies that minimize the need for signal regeneration should ultimately make adding more bandwidth faster and less costly for communications providers.

But he expressed some doubt about whether the savings would be passed on to large users.

Broadwing officials declined to discuss the costs associated with the technology, which they said should be commercially available by year's end.

But Grier Hansen, an analyst at Pioneer Consulting LLC in Cambridge, Mass., said the potential cost savings are significant.

"Electrical regeneration is very expensive," Hansen said. "Specific numbers are hard to come by, [because] carriers don't want to give them out. But you're probably talking at least a 50% savings for provisioning [by going all-optical]." ◗

Stronger Signal

Electrical regeneration:

- Converts optical wavelengths to electrical signals
- Amplifies electrical signals
- Converts electrical signals back to optical
- Regeneration required every 500 to 600 kilometers on a 10G bit/sec. link.

Optical amplification:

- Minimizes the need for electrical-to-optical conversion
- Can add bandwidth as needed without dispatching technicians
- No regeneration needed for 10G bit/sec. speeds at distances of up to 4,000 kilometers

Gavel Falls Down on Auctions.com

Classified Ventures to focus efforts on real estate, autos

BY MEGHAN HOLOHAN

Citing low traffic and a plan to focus on their real estate and automotive Web sites, the owners of Auctions.com said last week that the online auction site will close Aug. 31.

The site couldn't compete with auction giant eBay Inc., said Bess Gallanis, vice president of corporate communications at Chicago-based Classified Ventures Inc., which owns Auctions.com. Classified Ventures is a conglomerate of media corporations, including The New York Times Co., Gannett Co., Knight Ridder, The McClatchy Co., Tribune Co. and The Washington Post Co.

All auctions will end Aug. 30, the company said. Members of Auctions.com and local market partners will receive refunds on their investments.

"Auction technology is costly and complicated," Gallanis said. "We have had to make hard decisions on how to allocate resources."

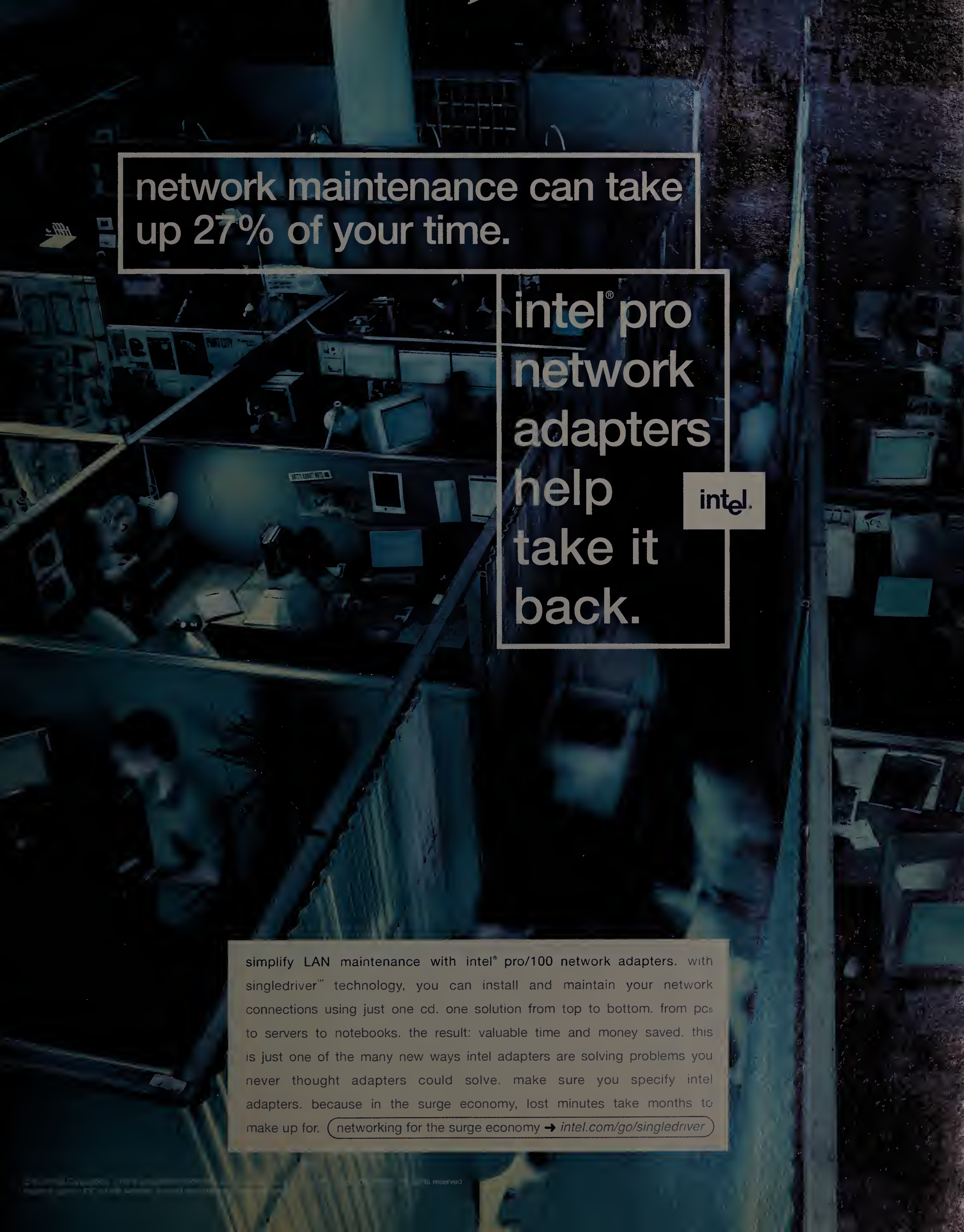
She said Classified Ventures' automotive and real estate sites consistently rate as the second most-visited in their respective markets.

Alan Alper, an analyst at Gomez Advisors Inc. in Lincoln, Mass., said Auctions.com didn't rank highly in the researcher's evaluation of auction sites.

The site didn't have enough categories for auctions and didn't have the advanced tools used by other auction sites, Gomez Advisors found.

"Let's be honest here: It's a tough space to get into if you're not eBay, Yahoo or Amazon," Alper said.

In 1997, Auctions.com was launched as Auctionuniverse.com. In 1998, Classified Ventures acquired the Web site and launched it last December under its current name. ◗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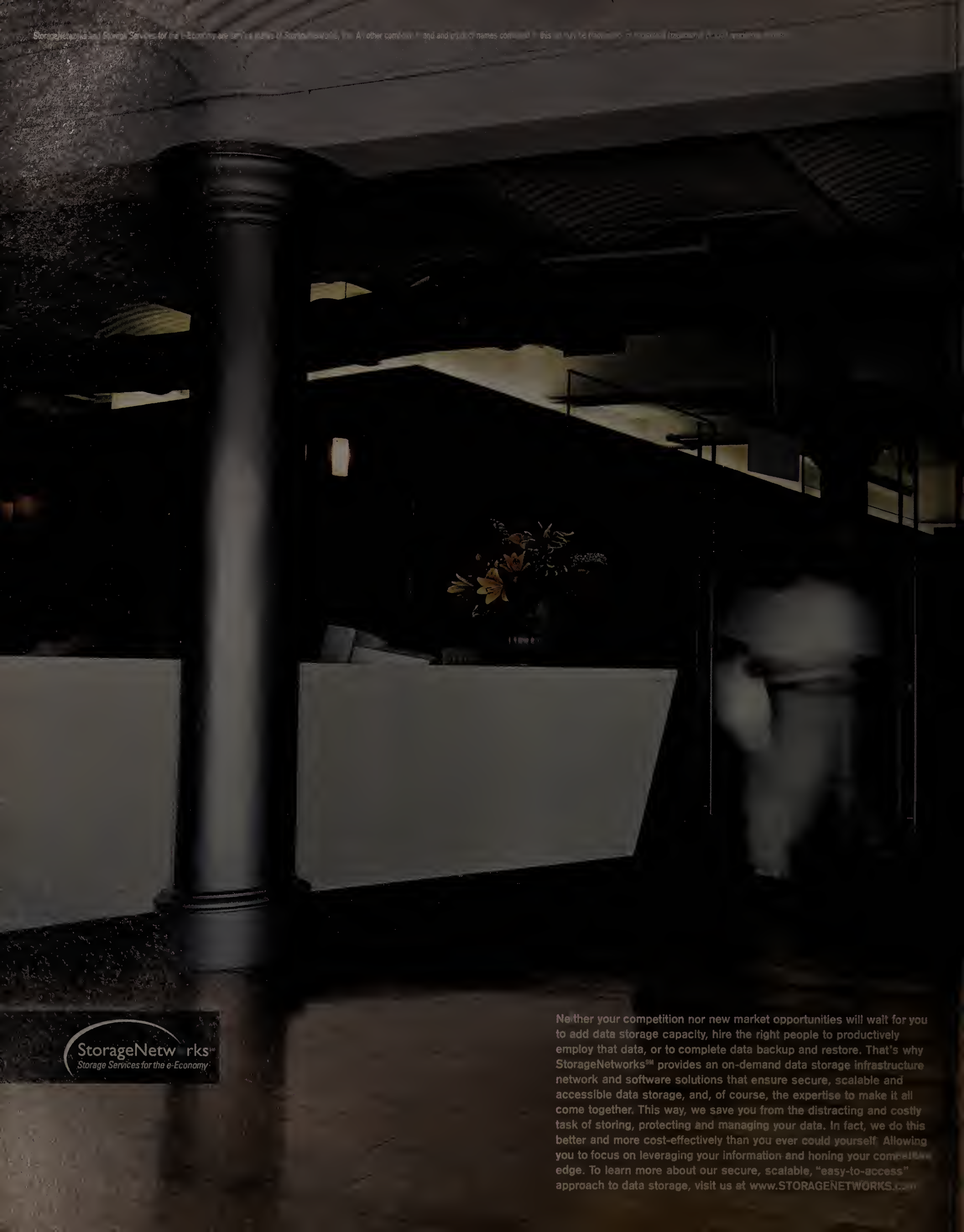

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Taiwan, Estonia Emerge as Good Places for E-Commerce

But study says Russia, Middle East and Africa lag in online infrastructure

BY MITCH BETTS
WASHINGTON

LOOKING FOR fresh online markets to enter? Taiwan and Estonia have emerged as leaders among developing countries in the ability to support e-commerce, according to a report released last week.

However, the report said Russia and much of the Middle East and Africa are lagging badly in terms of the infrastructure and human capital needed for online business. The study rated 42 developing countries on their "e-readiness" based on factors such as government support for e-commerce, the availability of wire-line and wireless communications services, worker skills and laws against cybercrime and software piracy.

The study's author is Bruce McConnell, a former White House official who led the International Y2k Cooperation Center, which rated countries on their progress in fixing computers for the year 2000 date rollover. He now runs a Washington-based consulting firm, McConnell International LLC; he used his contacts throughout the world to compile the study.

Economic Growth at Risk

The report indicated that countries such as Russia, Indonesia, Pakistan, the Philippines, South Africa and Saudi Arabia have serious obstacles to being ready for the New Economy (see chart). "Economic growth is at risk unless these countries take prompt action," McConnell said.

John Hamre, president of the Center for Strategic and International Studies, a Washington-based think tank, praised the study for going beyond slogans about the so-called digital divide and providing country leaders with a road map for bridging that gap.

There were pockets of good news in the study. For example, Costa Rica is emerging as an e-commerce-friendly location in Latin America, Hungary has invested heavily in high-tech education and India has a comprehensive set of laws regarding information technology.

Taiwan, Malaysia and South Korea have taken a "build it and they will come" approach, with government-led investments in multimillion-dollar technology hubs, according to the report.

Estonia may be the biggest surprise on the list. Today, 28% of Estonia's population is connected to the Internet, and 90% of public employees have a computerized workplace. In February, the Estonian parliament approved a proposal to guarantee Internet access to every citizen.

McConnell and other experts emphasized that mobile phones and other wireless Internet access devices show the most promise for developing countries.

"The PC in the home is the U.S. model, not the world model," McConnell said.

Carlos Primo Braga, manager of the IT development program at the World Bank in Washington, said he agreed. He pointed out that Brazil doubled its telephony penetration with wireless phones in the past two years. ◗

Global Report Card

Developing countries were rated on their readiness for e-commerce based on factors such as security, human capital and business climate.

LEADERS
- Estonia
- Taiwan
- Costa Rica
- South Korea

LAGGARDS
- Ecuador
- Indonesia
- Pakistan
- Vietnam
- Kenya
- Nigeria
- Saudi Arabia
- Tanzania

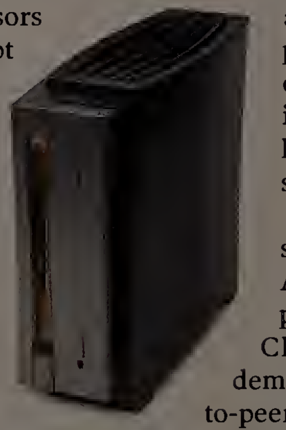
SOURCE: MCCONNELL INTERNATIONAL LLC, WASHINGTON

Intel Courts IT Managers at Conference

CEO: Peer-to-peer is the next challenge

BY MARK HALL
SAN JOSE

Information technology managers played a central role in Intel Corp.'s developers conference here last week. The company unveiled improved server processors along with a "concept PC" targeted at IT.


THE AKIRU Accessible Desktop PC

CEO Craig Barrett argued in his keynote that peer-to-peer computing — running parts of an application on different computers across the Internet — is becoming a technology "that IT managers are going to have to worry about."

Intel announced that it has begun shipping the first Pentium III Xeon processors running at 1 GHz. Xeon chips are used in multiprocessor servers and high-end workstations.

Barrett said that with the new processors, the company is ready to handle all e-commerce data center needs.

But Intel-based systems will remain largely excluded from data centers running data mining and big database applications, said John Enck, an analyst at Stamford, Conn.-based Gartner Group Inc. He said Intel technology is ubiquitous in all other e-commerce server installations.

Barrett also said information technology will soon be using peer-to-peer systems. Citing how Napster Inc. works among hundreds of servers online for consumers of MP3 music files, he said IT managers will use idle processing power of PCs and servers inside their firms to handle data-intensive applications.

Andrew Grimsha, an executive at Applied MetaComputing LLC in Charlottesville, Va., demonstrated a peer-to-peer application in use at The Boeing Co. and the U.S. Department of Defense.

Others said they're doubtful about peer-to-peer computing's usefulness. "It will need a lot more definition before anyone can say one way or the other," said Tim Wright, CIO of Lycos Inc. in Waltham, Mass.

David Wu, an analyst at ABN AMRO Inc. in San Francisco, said peer-to-peer computing isn't ready for commercial use. But, he said, "if IT could do it, they would." Enck echoed Wu, adding, "There is no business infrastructure in place to handle peer-to-peer issues" such as security and management.

One analyst went so far as to call peer-to-peer computing "an IT menace, not a benefit." Bob O'Donnell at International Data Corp. in Framingham, Mass., said IT managers need to worry about users who include their machines without IT's knowledge in peer-to-peer operations such as SETI's hunt for intelligent life in the universe, which uses in part, idle PCs connected to the Internet.

At the conference, Intel gave an award to the Akiru Accessible Desktop , a concept PC designed for corporate use, because it gives administrators "tools-free" access to removable components, similar to the G3 systems Apple Computer Inc. introduced last year. ◗

Intel Demos Pentium 4 at 2 GHz

Intel cranked a Pentium 4 processor up to 2 GHz last week in a technology demonstration designed to show off the prowess of its forthcoming desktop PC chip.

The Pentium 4, due in PCs in the fourth quarter, is based on a new chip design – or microarchitecture – that was designed for computing on the Internet, said Albert Yu, senior vice president in charge of Intel's microprocessor products group.

YU: Pentium 4 was designed for the Net

Called NetBurst, the architecture was designed from scratch for multimedia applications, such as streaming audio and video, as well as for the kind of algorithms used to encrypt data sent over the Web.

Intel has shipped 6,000 prototype Pentium 4 PCs to developers, who are busy developing products for Pentium 4 systems.

Intel plans to introduce the Pentium 4 at 1.4 GHz or higher. It showed a prototype PC that sported a 1.5-GHz processor then ran a demonstration in which a Pentium 4 was ratcheted up to 2,002 MHz, or slightly over 2 GHz. It showed just how much clock speed Intel may be able to squeeze out of its new design.

The chip wasn't cooled by cooling equipment, said Intel CEO Craig Barrett. He wouldn't say when Intel might ship a 2-GHz chip commercially.

At the core of the chip is what Intel calls a Rapid Execution Engine, which allows the core of the processor to operate at a frequency twice that of the rest of the chip, Yu said. The chip sports 256KB of on-chip Level 2 cache memory. It will be built initially using Intel's 0.18-micron manufacturing process, moving to a 0.13-micron process next year. – *James Niccolai, IDG News Service*

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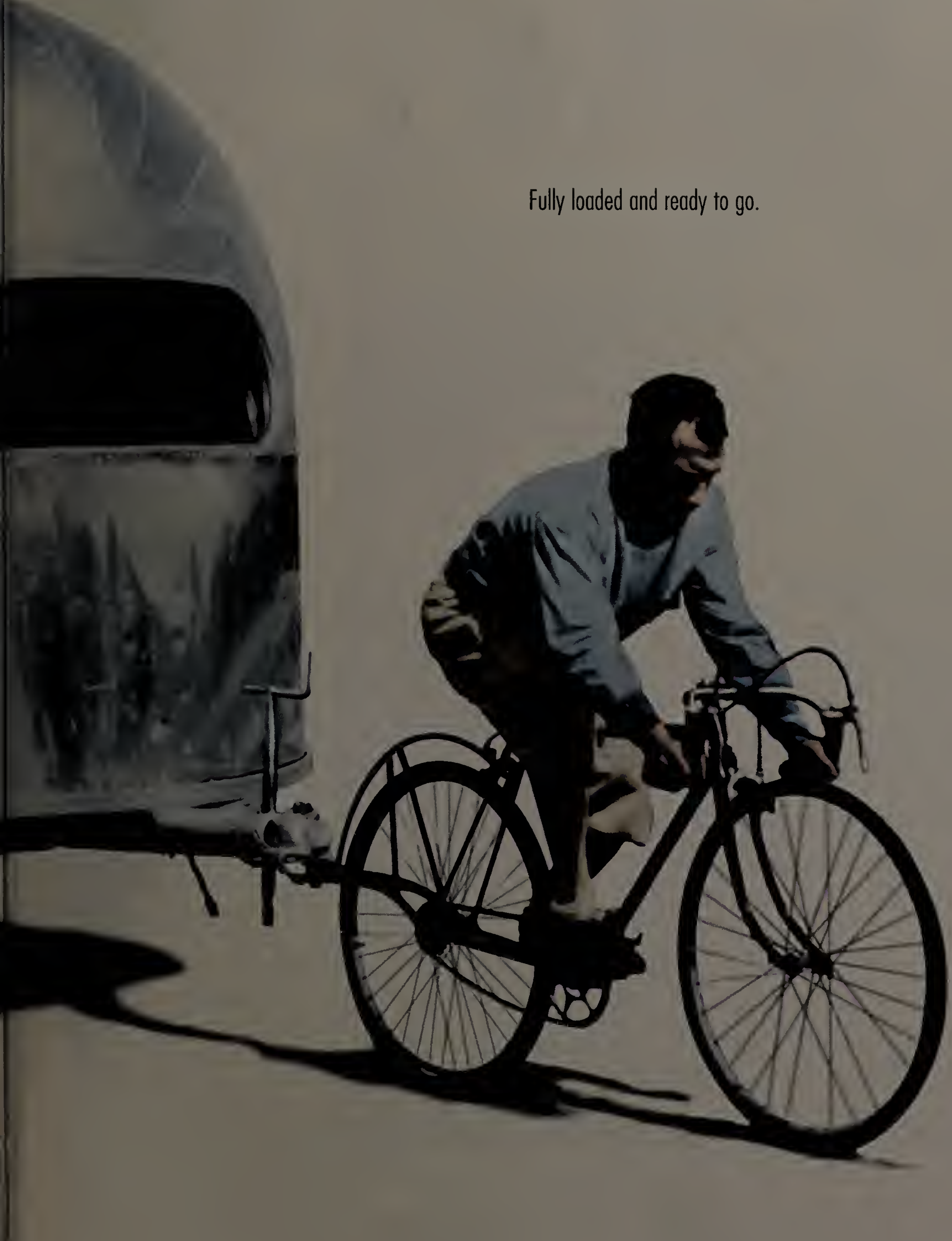

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Dow to Fire up to 40 More Employees for E-Mail Abuse

BY MARIA TROMBLY

The Dow Chemical Co., which had problems earlier this year with employees transmitting pornographic e-mail, last week said it will fire up to 40 more employees because of new violations.

The two cases are unrelated, according to spokeswoman Kanina Blanchard, who noted that it isn't Midland, Mich.-based Dow's policy to monitor e-mail. She said the more recent violations, which took place at the company's Freeport, Texas, location, came to light as a result of complaints by other employees.

"When employees make a specific complaint — as in this case — it triggered an investigation, which included a review of the servers which host the e-mail accounts," she said.

Employees who had pornographic or violent materials in their accounts were investigated, she said. Those who actively brought in, saved and disseminated the material, those who had material that was extremely graphic or violent in nature and those with histories of violating Dow policies were singled out for termination, Blanchard said.

"This was a minority of employees," she said, adding that employees who innocently received pornographic materials weren't investigated.

"I personally have received off-color or inappropriate e-mails," she said. "Once you get on the spam lists, you all know what you get. But this is not the kind of activity that you would get questioned about."

Last month, Dow ended a separate investigation sparked by complaints that resulted in the dismissal of about 50 employees at its Midland site.

The company said the incidents have prompted it to increase efforts to communicate its e-mail policies to employees.

There is a lesson to be learned by other companies, said Lauren Haywood, acting president and CEO of the Electronic Messaging Association in Arlington, Va.

"The key thing is training and education for their employees," Haywood said. She added that it's important to establish and communicate an e-mail privacy policy.

Ken Dort, a Chicago-based attorney at Gordon & Glickson LLC, said Dow had to investigate the pornographic e-mails to avoid appearing to support a hostile work environment.

"They really had no choice because sexual harassment was involved," he said. Dort added that Dow wasn't violating privacy rights, because an employer has the right to view e-mail in employees' corporate accounts. Dow had to look at the e-mail to determine if the claims of sexual harassment were true, Dort noted. ▶

Meghan Holohan contributed to this report.

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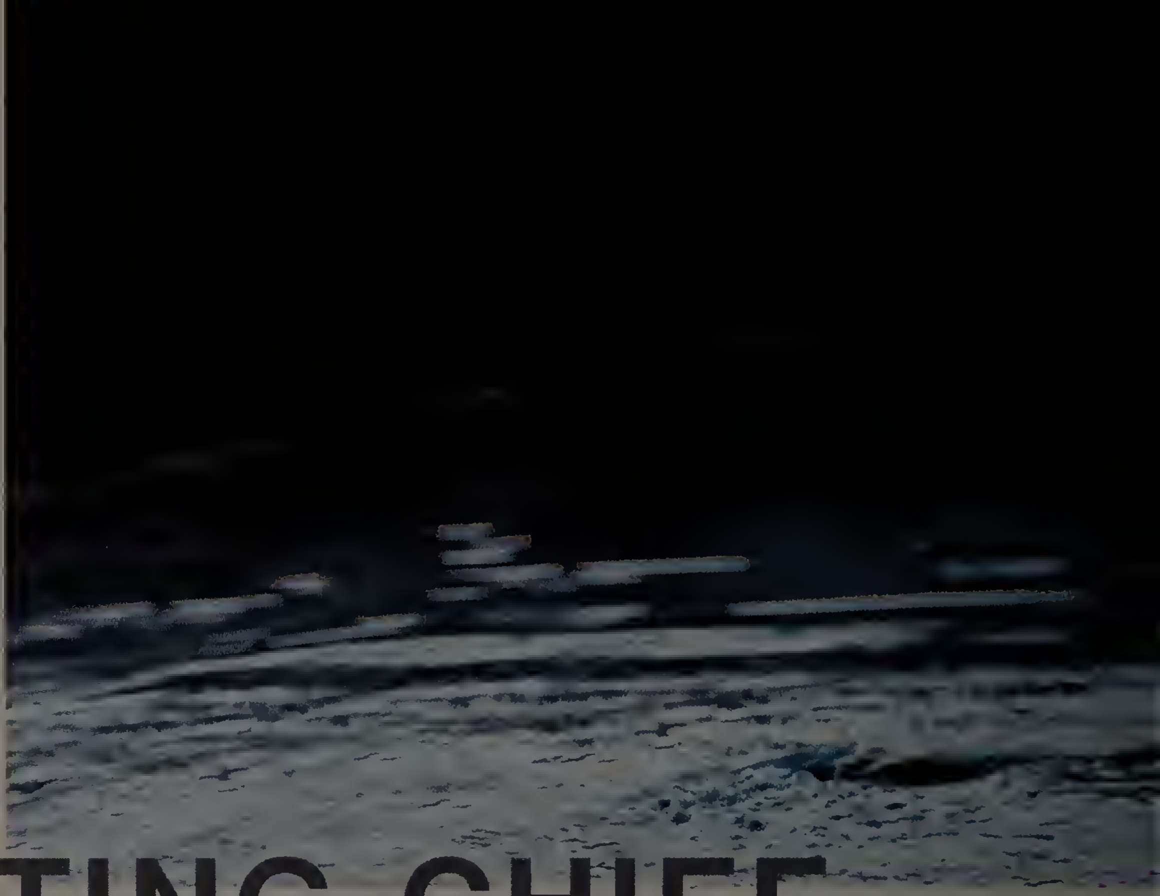

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BRIEFS

AT&T, EMC Ink Storage Pact

AT&T Corp. and storage systems firm EMC Corp. in Hopkinton, Mass., have entered into a partnership to provide "always-on" information storage services to firms that can't bear even short-term data losses. AT&T's Ultravailable Data service will offer managed data and storage systems with customized design for large data-sensitive enterprises, using EMC's Enterprise Storage Systems software, networks and services.

Ericsson, UUNet Team On Mobile IP Nets

LM Ericsson Telephone Co. and UUNet, a subsidiary of WorldCom Inc., are teaming up to develop mobile Internet services, including multimedia technologies using IP. Stockholm-based Ericsson will support Ashburn, Va.-based UUNet's bid to develop a global roaming network for Global System for Mobile Communications operators, an Ericsson spokesman said. The companies declined to reveal the financial parameters of the venture.

Cabletron to Buy VPN Provider Indus River

Enterasys Networks, the enterprise networking unit of Cabletron Systems Inc. in Rochester, N.H., announced that it's acquiring virtual private network provider Indus River Networks Inc. in Acton, Mass., for approximately $170 million in stock. Enterasys said that its clients are seeking low-cost, secure networks and that Indus River will assist in providing them with that technology.

Short Takes

NTT COMMUNICATIONS CORP. in Tokyo extended its tender offer for Internet backbone and Web-hosting provider **VERIO INC.** in Englewood, Colo., until Aug. 30 – the sixth time the company has extended its offer. . . . **NOVELL INC.** said NetWare 6, which is now in controlled beta-testing and is scheduled for release in the first half of next year, will feature new network storage capabilities that will integrate file, messaging, database and directory storage.

Red Hat Tips Cap to New Payment Model

Founder says firm has leg up on Microsoft with its 'pay-as-you-go' services pricing

DOMINIQUE DECKMYN
SAN JOSE

At the recent LinuxWorld show here, Red Hat Inc. revealed a wide-ranging software-bundling deal with IBM, joined other major vendors in supporting the Gnome Foundation's free desktop environment and announced the acquisition of Oakland, Calif.-based secure Web-server developer C2Net Software Inc.

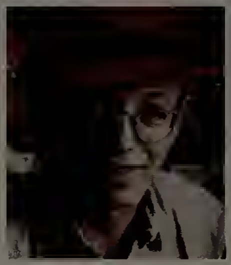
At the show, *Computerworld* spoke with Red Hat's founder and chairman, **Bob Young,** about the Research Triangle Park, N.C.-based company's financial wherewithal to back those initiatives.

Q: Red Hat, like some other Linux-related companies, has seen a pretty steep fall in its stock price since the spring, after hitting some very high valuations. Do you think Linux companies – and Red Hat in particular – were overvalued? And are they more fairly valued now?

A: The stock market looks at IPOs based on where they are trading compared to the price that the company set at its IPO. Our only opportunity to communicate to the market where we thought the company is a good value was when we set the price. After that, the market decides for itself, and we have no control. We set a price of $7 on a split-adjusted basis on Aug. 11 [last year, when Red Hat had its initial public offering]. Today, we're trading in the $20 range. By anyone's IPO standard, it was a very successful IPO. VA Linux [is also] doing reasonably well.

We subscribe to the Warren Buffett view of investing: He buys stock and puts it in a sock, and at the end of five years, if the company really was delivering value to the marketplace, that value will be reflected in the stock. So five years from now, I will take some responsibility for the Red Hat stock price. I don't even understand the short-term swings in stock prices, whether it's Red Hat's or Amazon's.

Q: Where will Red Hat's revenue come from?


BOB YOUNG: Red Hat had "a very successful IPO"

A: When we IPO'd, we were at a run rate of about $20 million in revenue a year. Today, we're at a run rate of about $80 million, so clearly we're making substantial progress. [Growth] is going to be in delivering value to the customers.

Sometimes we use terms like "support" and "services," but it's not the traditional [method of] putting a man in a van and sending him to customers. It's by building very sophisticated service capabilities on the Internet — building it once and selling it many, many times on a highly leveraged basis.

We expect that we will be able to deliver all the value that traditional software companies [offer]. In other words, we're changing the payment model — we're not changing the value proposition for the customer. You're buying subscription services to the latest version of Red Hat, you're buying technical support services, you're buying engineering services. When you come to think of it, Microsoft provides a lot of these kinds of services, only they charge you for it in the form of a per-machine royalty. Our model is more pay-as-you-go.

Q: So, is your model so different from the model that Microsoft is trying to achieve, with its increasing emphasis on Web services and software subscriptions?

A: Where they are trying to get to is very much where we already are. And good luck to them — they have got to re-engineer their company. They've got, as I've put it, this heroin addiction to selling per-machine licenses, and they're promising to move from that to a services-based model. We have a much easier job. We [were able] to build our services and [be a] subscription-based company from the ground up. ◗

Compaq Product Line Helps Blend Work/Personal Lives

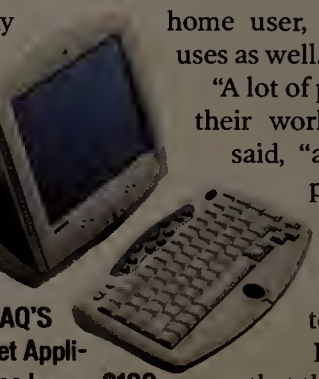
Wireless, Internet devices aimed at mobile employees

BY BOB BREWIN

Compaq Computer Corp. has introduced a line of wireless and home Internet devices aimed at enabling corporate customers to more effectively integrate their professional and personal lives.

The product line, announced two weeks ago, includes two versions of the popular BlackBerry wireless e-mail devices from Research In Motion Ltd. (RIM) in Waterloo, Ontario. One version is home networking equipment that can support either wired or wireless networks and is based on Microsoft Corp.'s Web Companion service. The other version is an MP3 audio player.

Although a number of other vendors, including Dell Computer Corp., resell the RIM BlackBerry devices, Jerry Meerkatz, vice president of Internet products and services at Compaq, said his company views the devices as an integral part of a corporate enterprise information system. The $399 iPaq W1000 and the larger, Palm-size H1100, priced at $499, will allow corporate clients to extend Microsoft Exchange e-mail networks to mobile workers in a cohesive manner, Meerkatz explained.


COMPAQ'S Internet Appliance, as low as $199

"We're going back to our corporate accounts with Exchange servers and talking to them about extending their usefulness to mobile workers with [the RIM products]," Meerkatz said. He noted that while the new Compaq iPaq Home Internet Appliance — which will sell for as low as $199 after discounts for signing up for service over the Microsoft Network — is pitched at the home user, it has business uses as well.

"A lot of people are doing their work at home," he said, "and we want to provide people with the devices to effectively get them to the Internet."

He emphasized that the deal with RIM in no way diminishes Compaq's interest in the iPaq — its version of Microsoft's Pocket PC — which was introduced in April as a core piece of its mobile computing strategy. Compaq underestimated demand for the Pocket PC, whose sales have been "overwhelmingly successful," Meerkatz said.

Ken Dulaney, an analyst at Gartner Group Inc. in Stamford, Conn., backed that assessment. "Compaq is sold out of the Pocket PC," he said.

Michael Mace, chief competitive officer at Palm Inc. in Santa Clara, Calif., said Compaq's continued push into the mobile computing market was expected.

"This is not news," he said. "Compaq is pushing every button they can" to get into the market. As at Compaq, business at Palm "continues to exceed even our very aggressive forecasts," Mace said. "We're growing at 100% a year . . . and have underestimated demand." ◗

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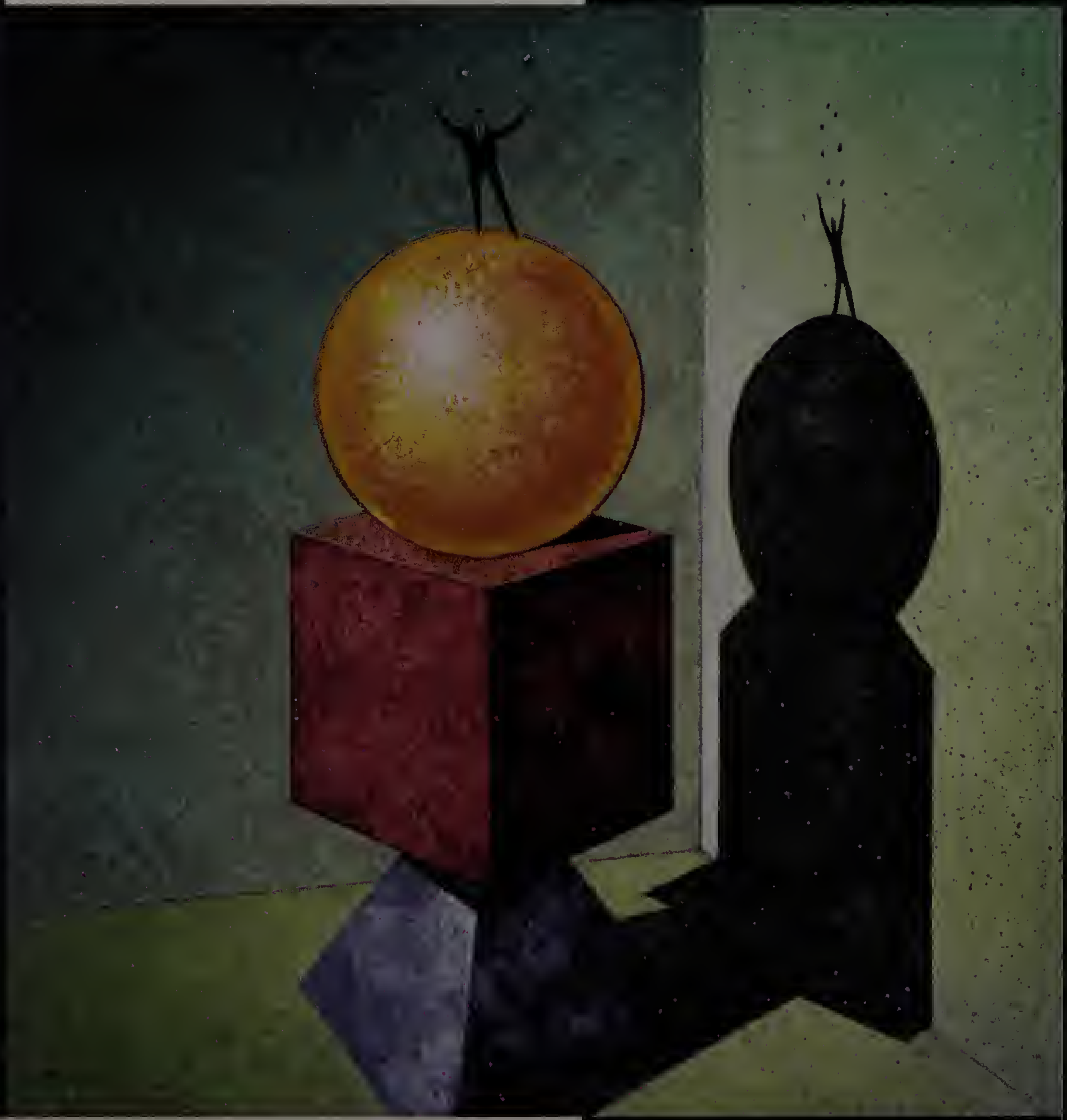

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INTEROPERABILITY THE Storage Networking *Challenge*

John Webster
Senior Analyst & IT Adviser
Illuminata Inc.

The survival of storage networking depends on interoperability among its many components and constituents. While the network storage industry is on the verge of meteoric growth, its largest inhibitor is the need for the myriad hardware devices and software applications produced by over 200 different vendors to interoperate reliably and predictably.

To address user demand for heterogeneity and interoperability among devices and management applications within a networked storage environment, vendors have formed alliances and consortia to establish standards by which they will develop and implement storage networking solutions. But standards proposals, some conflicting, have proliferated along with products. Does this mean that chaos reigns? Or is there order to this process? If so, who establishes the priorities and who sets the agenda? The IT user community is generally not aware of its ability to directly influence the storage interoperability agenda.

Many Products, Many Standards

This is an extremely fertile moment within the storage industry. At no other time in the history of computing has there been more demand for solutions that help enterprises effectively manage volumes of information, driving storage vendors to create and innovate products and technologies faster than ever before.

Vendors are flooding the market with components and anticipating a major up-tick in user demand for SAN and NAS solutions. The larger vendors are offering a spectrum of storage networking solutions, while smaller vendors are entering the market with specialized point solutions from simple host-bus adapters to highly intelligent switches and storage arrays.

Users understand the immense complexity of storage networking. Along with hardware component interoperability issues, there are differing file system and database structures, operating system incompatibilities and storage resource management applications.

Many times, the quickest way to get a new product to market is to build on a technology that already exists. Alliances effectively promote these cooperative ventures. But they serve as a forum for the discussion of standards requirements. Some of these groups, including the Storage Networking Industry Association (SNIA) and the Fibre

Alliance, are becoming quasi extensions of established standards bodies, like the Internet Engineering Task Force (IETF) and the American National Standards Institute (ANSI), by formulating interoperability specifications and proposing them ready-made for adoption by these more established groups.

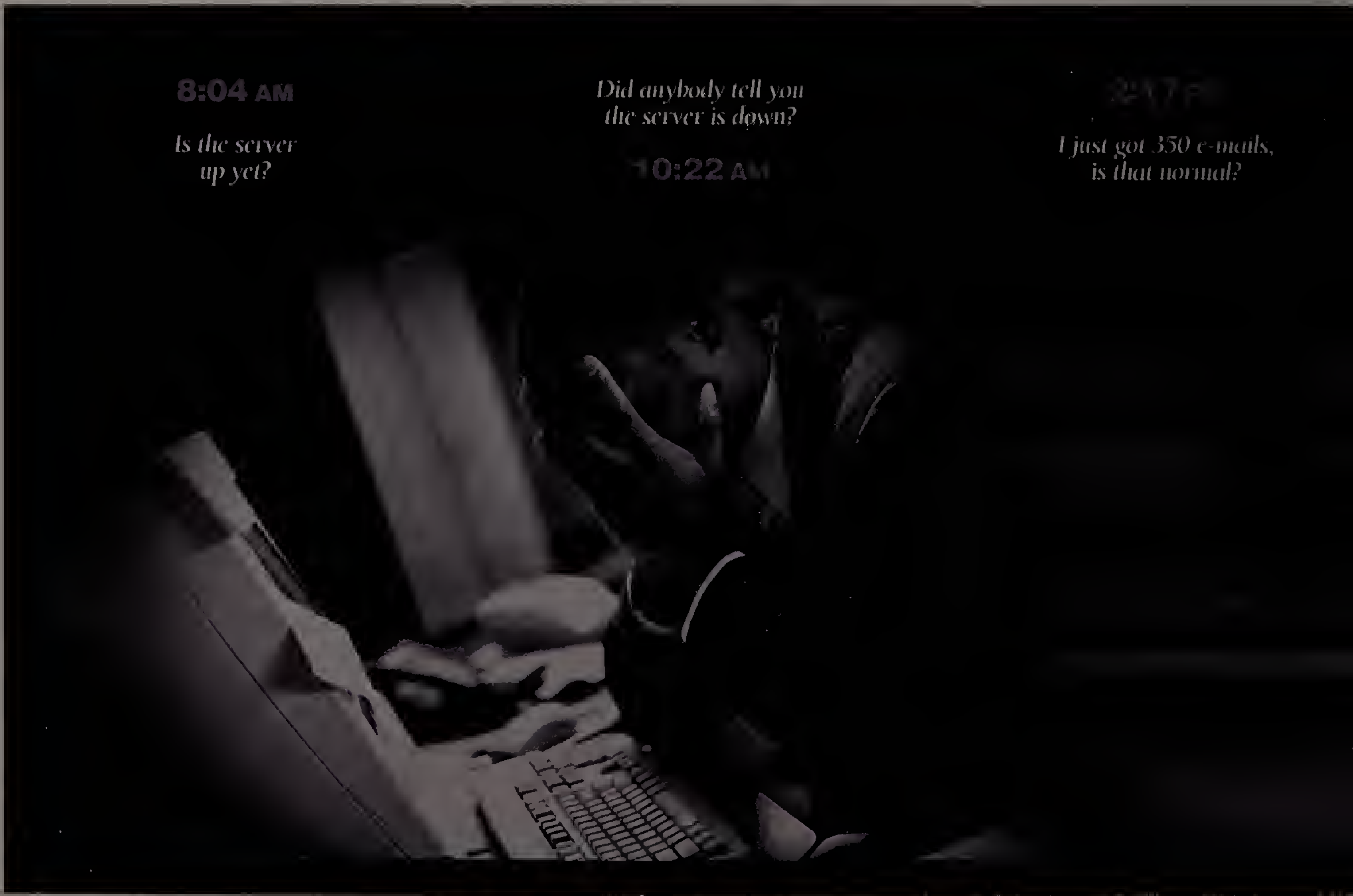
Driving Innovation

Primarily, it is user demand that drives innovation in the storage industry. The IT user community is newly focused on storage as a way to solve problems in information logistics — how to best store, move and manage information.

Consequently, multiple and diverse networked storage products are entering the market simultaneously, many with a set of inter-dependencies on others. For SANs to work, for example, Fibre Channel Host-Bus Adapters must talk to Fibre Fabric switches that, in turn, must talk to disk arrays and tape libraries with fabric interfaces. Each link in the I/O chain must be as dependable as the next. If not, storage networks cease to function and users look elsewhere for answers.

Making it Stay

The survival of storage networking depends on interoperability among its many components and constituents. The storage networking vendor community senses the urgency most acutely and is responding


8:04 AM
Is the server up yet?
Did anybody tell you the server is down?
10:22 AM
2:17 PM
I just got 350 e-mails, is that normal?

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with a multibillion dollar investment for the development of interoperability standards and testing facilities. It is coming together around existing standards bodies as well as creating its own. The drive to interoperate is so intense that there are now at least fifteen major standards initiatives for storage networking presently in play. And again, many of the proposed standards have a set of interdependencies with others.

Sorting it Out

The following table (page 6 to page 9) will help sort through the outstanding storage networking standards initiatives. These standards are defined and summarized in the table. It will also show how close the industry is to seeing the adoption of each. The status column indicates where in the adoption process each proposal sits and at what stage of development each has reached. Each standard is either in Stage 1 or Stage 2. Stage 1 indicates that a set of specifications has either been written or is in the process of being written. Stage 2 indicates that the standards are being implemented in the form of products and tested for interoperability with others conforming to the standard. Stage 2 standards can be used today.

[illegible]

What do you mean, you don't know how many directories were infected?

Is it okay if I go ahead and empty your trash?

6:14 PM

8:35 PM

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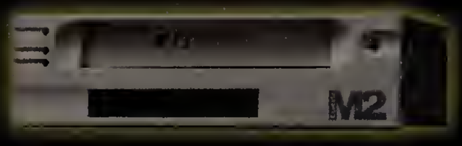

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Interoperability Standard	Significance	Status
Microsoft's Common Internet File System (CIFS) protocol.	The SNIA NAS Working Group is making CIFS a heterogeneous file system standard. It's a standard NAS file-sharing protocol. Broadening its applicability to SANs would help to unify SAN and NAS architectures with a common file system protocol for data sharing, network administration, security and directory services.	Stage 2 The SNIA NAS Working Group is working to completely document CIFS. A list of proposed CIFS specification changes has also been published.
Direct Access File System (DAFS). A file access protocol that uses the Virtual Interface (VI) to provide direct application access to shared file servers.	DAFS proponents want to wring as much of the latency out of I/O traffic in a networked storage environment as possible while preserving shared, multi-host file access to data. This is a requirement for high-capacity NAS devices. DAFS uses the low-latency, open VI standard developed by Compaq, Intel and Microsoft for heterogeneous server clustering. VI implements direct memory-to-memory transfer of bulk data, by passing the normal protocol processing required with conventional I/O channels.	Stage 1 The DAFS Collaborative, includes Intel, Network Appliance, Seagate and 25 other vendors. A draft of the protocol specification has been written and is undergoing further refinement
Fibre Channel over IP (FCIP). A proposed method for encapsulating Fibre Channel frames for transport over IP networks.	SANs allow shared access from multiple servers to multiple storage devices, eliminating the storage device as a data island. However, SANs can be seen as virtual private networks, as such can become data islands unto themselves. SANs use Fibre Channel as the interconnect medium. Encapsulating Fibre Channel frames for transmission over IP networks provides interoperability among SANs and overcomes the SAN as data island issue.	Stage 1 The FCIP proposal presently exists as an Internet-Draft within the Internet Engineering Task Force (IETF).
Fibre Alliance Simple Network Management Protocol (SNMP)-based Management Information Base (MIB) for Fibre Channel storage networks.	The task of the Fibre Alliance has been to develop a MIB specification for SNMP-based storage management. The Fibre Channel Management Integration MIB provides a method for managing multiple devices across heterogeneous storage networks and serves as a building block for other SAN interoperability initiatives. It can be used to define and describe the status of a heterogeneous storage network and its components.	Stage 2 The Fibre Alliance has completed its work on MIB development and has submitted the proposed standard to the Internet Engineering Task Force (IETF). Multiple vendors support and ship MIB compliant products.

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Interoperability Standard	Significance	Status
The Fabric Shortest Path First (FSPF) routing protocol. This protocol specifies a common method for routing and moving data among Fibre Channel switches.	A stumbling block to SAN adoption is uninteroperability among cascaded switches manufactured by different vendors. Before the FSPF standard there was no standard to ensure consistent routing of data among Fibre Channel switches from different vendors. The FSPF routing protocol enables any FSPF-compliant switch to interoperate with other FSPF-compliant switches regardless of manufacturer.	Stage 2 Accepted by the National Committee for Information Technology Standards (NCITS) for approval.
InfiniBand. A switched-fabric I/O connectivity standard under development by the InfiniBand Trade Association.	InfiniBand, a potential alternative to PCI and Fibre Channel standards, is in development by vendors including Intel, IBM, Compaq, Dell, Hewlett-Packard, Microsoft and Sun Microsystems. It merges Future I/O and Next Generation I/O architectures into one specification. It will extend the range of network I/O to 17 meters using copper cabling, 100 meters with fibre optics. Bandwidth of 500MB to 6GB per second is planned.	Stage 1 Version 0.95 of the InfiniBand Specification is due by late this month with a final Version 1.0 due by Oct. 2000.
Internet SCSI (ISCSI). A method for encapsulating SCSI commands for transport over IP networks.	With the advent of gigabit Ethernet technology, there is interest in using IP networks as a transport mechanism for storage traffic. This requires the encapsulation of the SCSI protocol and other Fibre Channel protocols for transport over IP-based networks.	Stage 2 The iSCSI proposal exists as an Internet-Draft within the Internet Engineering Task Force (IETF).
Common Information Model Object Manager (CIMOM). Defines heterogeneous computer systems, storage media and network ports as standard objects.	The SNIA's CIMOM is the industry's first open source implementation of the Distributed Management Task Force's (DMTF) Web-Based Enterprise Management (WBEM) standard. It's based on the following three components of the DMTF's WBEM standard. 1. CIM Schema. 2. The ability to encode the schema and its data using an XML Document Type Definition. 3. A set of HTTP operations to exchange the XML-based information between client applications and providers. CIMOM is written in Java and the programming interfaces are based on WBEM APIs.	Stage 1 The SNIA functions as the collection and aggregation point for CIMOM contributions, and will incorporate submissions into future revisions of the Object Manager. A WBEM and CIM-based storage management prototype was demonstrated at Storage Networking World (Oct. 1999).

Interoperability Standard	Significance	Status
Storage Media Library MIB. Allows centralized storage resource management applications to interoperate with media and library device management applications from multiple vendors.	Tape libraries have traditionally been controlled and managed by device-specific applications limiting management of these devices to a single application. Creation of a standard media library MIB facilitates the ability to share a media library among multiple management applications in a storage networking environment.	Stage 1 Initial CIM mapping of the IEEE media managment model is presently under review.
Network Data Management Protocol (NDMP). Defines an open architecture for backing up and restoring heterogeneous file servers on an IP network.	NDMP facilitates backup and restore operations in a multi host, storage networking environment by minimizing the control code that resides on data servers. NDMP supports interoperability with a variety of data management solutions. NDMP was originally intended for use with storage network-attached tape drives, it will be extended to address other devices and media in the future.	Stage 2 Originally developed by Intelliguard (now Legato) and Network Appliance, both companies have transferred management of NDMP Version 3 to the SNIA. Multiple vendors are currently shipping NDMP-compliant products.
The Object-Based Storage Device (OBSD). Defines standards for moving low-level storage functions into the storage device, and accessing the device through a standard object interface.	The OBSD Work Group within the SNIA will continue to build upon the work already done in this area by the National Storage Industry Consortium's Network-Attached Storage Devices (NASD) Project.	Stage 1 The SNIA and ANSI have begun collaboration on the use of SCSI commands to carry OBSD requests.
Policy-based Management. The automation of storage resource management processes and procedures leading to the consistent delivery of required service levels.	Policy-based storage management directly addresses the critical need for enterprises to manage burgeoning amounts of information with limited staff. Policy-based storage management techniques also allow operations staff to reliably implement service level agreements within the context of a networked storage environment. The SNIA has formed a Policy Management Working Group tasked with determining ways to enable enterprise-wide, heterogeneous policy-based management solutions.	Stage 1 The Policy Management Working Group within the SNIA has published an extensive reference listing for policy to its web site. It is also conducting vendor and customer policy surveys to determine priorities.

John Webster directs Illuminata's Information Logistics Companion. With more than 18 years of experience in the areas of information storage and platform technologies, he advises Illuminata's clients on topics relating to storage area networks (SAN), network attached storage (NAS), data management and replications software, and information deployment and retrieval techniques.

The multiplicity of major standards proposals does not represent chaos in the industry. Some standards are evolutionary, others revolutionary. SCSI 3 Extended Copy Services is an evolutionary addition to the SCSI command set. On the other hand, iSCSI — encapsulating SCSI commands for transmission over IP networks — is revolutionary. History shows that evolutionary changes have the best chance of reaching fruition short-term, while revolutionary changes often take years. We will see evolutionary changes like Extended Copy and Fabric Shortest Path First (FSPF) in use in corporate and Internet data centers before more revolutionary proposals like iSCSI and InfiniBand infiltrate.

The interoperability process is controlled primarily by user demand, but vendors need to bring interoperability standards into the IT mainstream. But with so many standards proposals, it is hard to determine who manages the process and who establishes priorities and sets the agenda.

In the absence of established standards bodies taking up the cause, vendor-guided organizations like the SNIA, the Fibre Channel consortium and the Fibre Alliance were formed to set ground rules and interoperability specifications. Vendors designate "volunteers" to these organizations. These volunteers are not paid by the organizations to which they belong. However, they are paid by the vendor company they work for. Consequently, the vendor community sets the storage networking interoperability agenda. There are direct ways for users to participate in the standards process. Users are not taking advantage of the opportunities. Illuminata notes that while 600 people attended a recent SNIA forum, only 25% were users. This is unfortunate because there were opportunities for users to learn how the SNIA functions and for them to influence the agenda.

The SNIA conducts sponsored surveys, the results help determine the agenda. It has formed a consumer council which recently completed a survey of the user community. Results from these surveys help the SNIA determine which interoperability issues are the most pressing and which can be resolved at a later date.

The IT user community is not aware of its ability to set the storage interoperability agenda. Anyone with an interest in storage networking interoperability issues can become a SNIA member for $300. With membership comes the opportunity to serve on one of the SNIA's working committees. However, the SNIA's board of directors is composed entirely of vendor representatives. One way to get direct user representation within the SNIA is to include representatives from established user groups. This would emphasize end-user focus within the IT community and make it the central forum for the storage industry.

Illuminata strongly urges users to become more involved in the interoperability standards setting process. The vendor community welcomes the guidance from storage networking users. Strong, direct signals from users would speed the standards formulation and testing process and drive the required interoperability solutions to the marketplace sooner rather than later.

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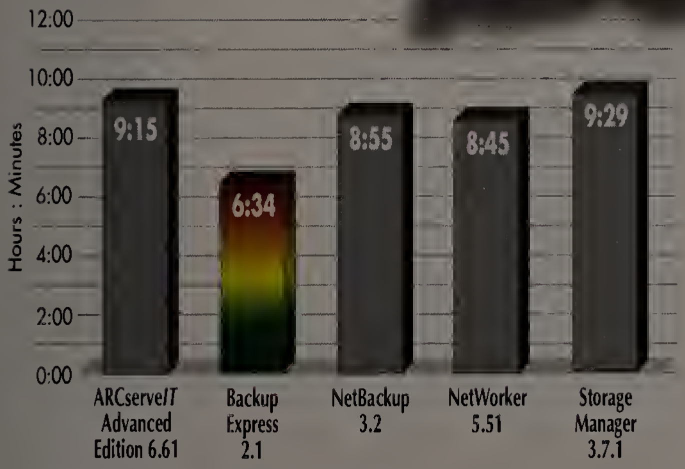

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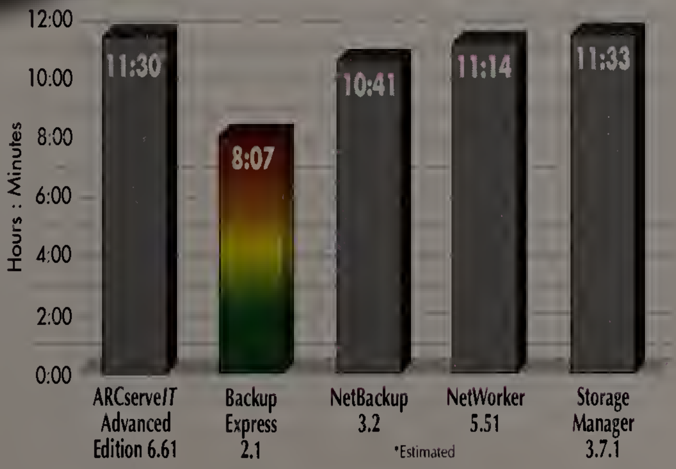

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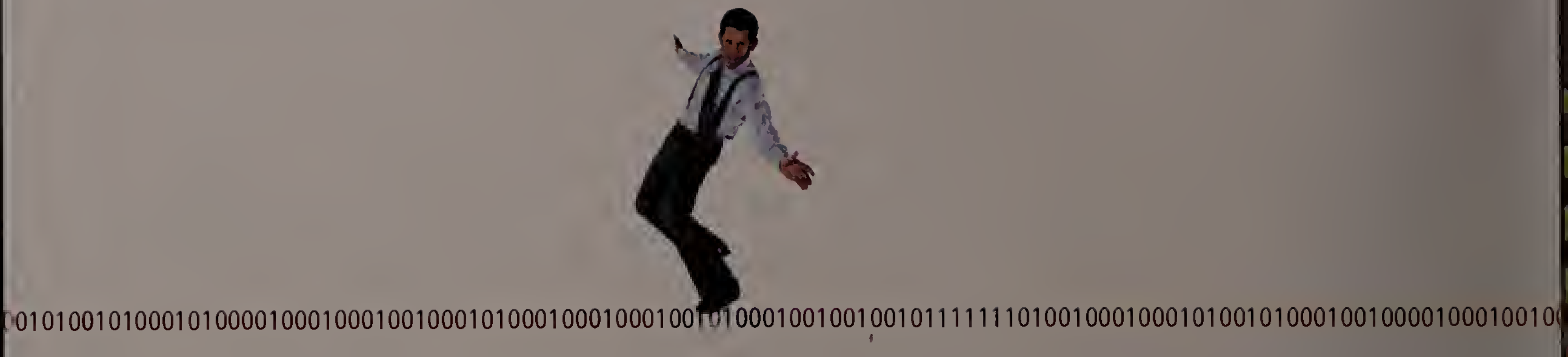

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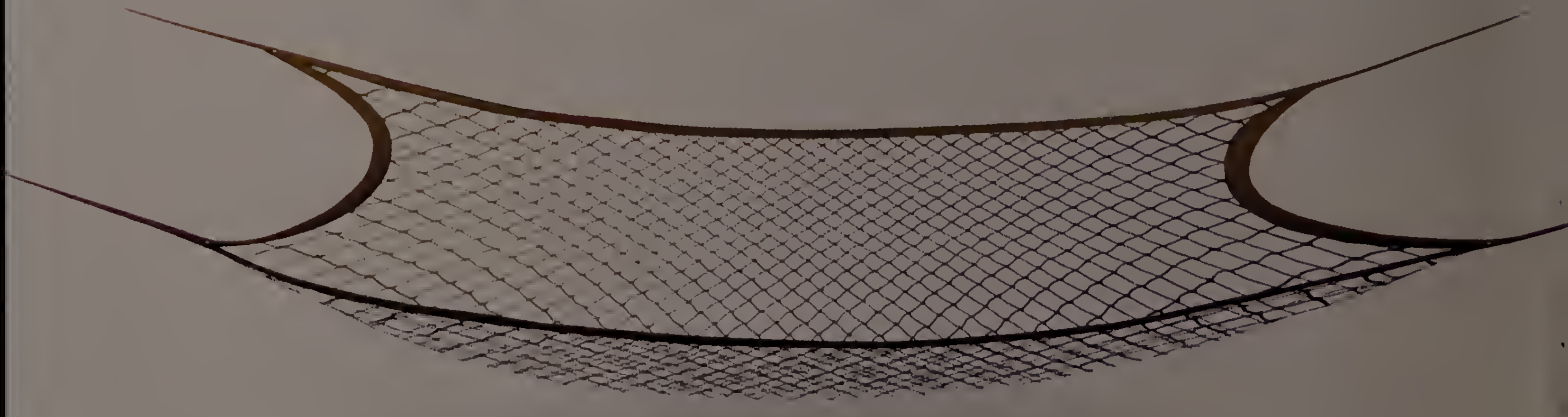

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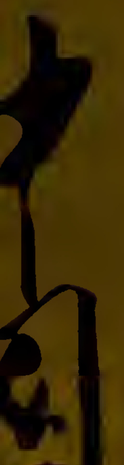

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MARK HALL

It's a go for I/O

JOURNALISTS MISTRUST vendors when they posit platitudes like "Our primary goal is to serve customer needs." Too often, they are the self-serving verbal trappings tacked onto a new product introduction or the explanation as to why another product is late in delivery. With my unabashed cynicism intact, however, I'm encouraged by similar comments from a vendor consortium dedicated to replacing the tried-and-true PCI bus.

MARK HALL is *Computerworld*'s West Coast editor. You can contact him at **mark_hall@computerworld.com.**

Despite its marketing-inspired name, Infiniband is the heir to a long line of system buses — ISA, EISA, Sbus, MCA and, of course, PCI — that have plagued IT operations for decades. Infiniband promises more performance, easier management and increased distance between system components and processors. Data center managers will love it because it will make upgrades, backups, troubleshooting, management and maintenance of servers and attendant hardware a breeze compared with today.

Infiniband has more than 180 backers. It's the result of a merger last summer of two competing technology development efforts — Future I/O and NGIO. Each had its powerful industry supporters, and many observers thought they would ultimately fight it out.

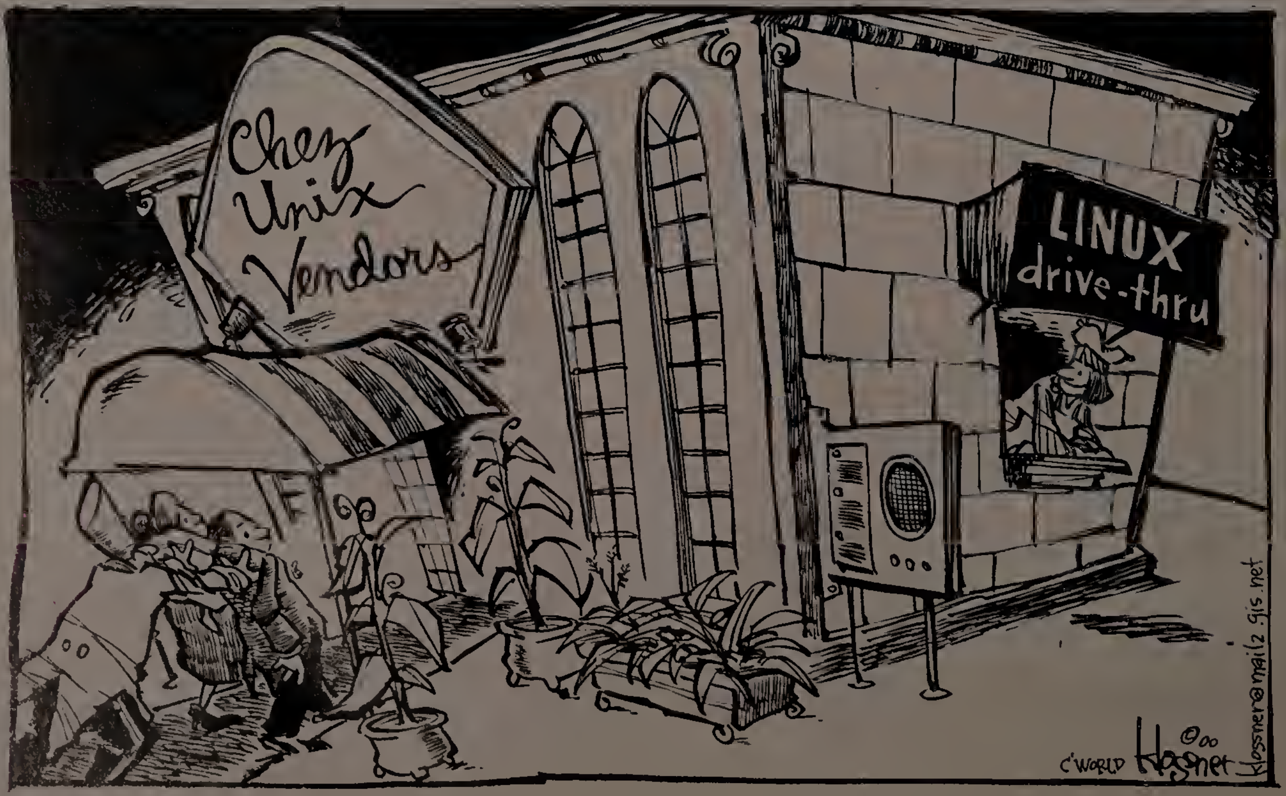
But in a rare stroke of sanity, fierce competitors put aside their posturing in favor of a single, open I/O architecture. In the age of the Internet, vendors reasoned, it made no sense to consciously design incompatibilities into a fundamental IT building block — I/O.

The Infiniband Trade Association (ITA) says it will release its final specification by October. Maybe six or nine months later, low-level components will begin to appear; about 12 to 18 months hence, Infiniband systems will hit the market.

The ITA claims that it needs the time because rigorous compliance procedures are necessary, both in the design of the specification and for real-world intervendor product testing. The ITA vendors say this is because "our primary goal is to meet user needs."

This time, I choose to believe the platitude because user needs and vendor needs are completely in sync. Users building complex data centers will exclude systems with known incompatibilities, meaning a lot of vendors will lose a lot of business. And none of them want their systems ostracized. In that light, the ITA's work is simply calculated vendor self-interest.

It's the kind of self-interest we need to see more often. ▸



DAN GILLMOR

Intellectual property: Does anyone care?

THE RACE TO CONTROL intellectual property is becoming the land-grab of the 21st century. But you won't hear a word about it in this year's presidential or congressional races.

I don't know whether that represents politicians' unwillingness to understand and discuss important issues, the public's preference for pabulum and easy answers, or both. But by the time the next presidential election comes around, unless people wake up to what they're losing on a daily basis, the system will be warped totally beyond recognition, perhaps beyond repair.

DAN GILLMOR is technology columnist at the *San Jose Mercury News.* Contact him at **dgillmor@sjmercury.com.**

Under the current system, enshrined in new laws and court rulings, tradition and the public interest have been abandoned. The winners in this land-grab are the companies, mostly large, that control intellectual property and persuade Congress to do their bidding on large and small matters.

Led by the nose by the entertainment and software industries, where greed and the desire to control users are boundless, Congress and other law-writing bodies have unbalanced long-standing equations. Congress warped the copyright law in 1998 with the Digital Millennium Copyright Act (DMCA), which gave holders of intellectual property vast new powers and absolute control over those who want to use it.

The DMCA isn't just about college students using Napster or Linux fans who want to use software that lets them play back DVD movies on unauthorized devices. It's about the free flow of information and the most severe threat ever to the "fair use" doctrine, which lets scholars, researchers and anyone else quote small parts of copyrighted works. If we live in a world where everything is pay-per-view, education will suffer. Libraries will die.

The patent system, meanwhile, has broken down as the U.S. Patent and Trademark Office grants monopolies to "inventions" of highly questionable originality, such as Priceline.com's online reverse auction, in which shoppers say what price they're willing to pay and vendors decide whether to sell at that price. Only the lawyers win in the challenge of bad patents, which are a deterrent to real innovation. Meanwhile, large companies are patenting the fundamentals of life itself. Will some multinational corporation own the rights to the seeds from which we grow crops that feed us, or the rights to our descendants' genes? It's possible.

Trademark law, too, is in a landgrab when it comes to Internet domain names. An increasing number of domain-name disputes are being taken to the World Intellectual Property Organization, which has a consistent record of ruling in favor of powerful interests.

Over time, these issues — particularly what's now called piracy — will take on ever-greater significance. When molecular manufacturing (nanotechnology) arrives, physical goods will be comprised of cheap raw materials and software blueprints.

We should worry if we can't figure out how to reward innovation without stifling the free flow of information when it comes to Napster. What will we do in the future, when the issues have even bigger consequences?

The politicians are silent on all of this. That worries me a great deal. ◗

DAVID MOSCHELLA

Net may do for education what others couldn't

IN AN E-BUSINESS world seemingly driven by competing forms of hype, this year's single loudest buzz is coming from the e-learning community. From Wall Street fortune-seekers to Ivy League professors, the powers that be have embraced the idea of the Internet as the ultimate learning tool. If you follow the topic at all, you've almost certainly run across Cisco CEO John Chambers' brash prediction that the e-learning industry will be so big, it will make e-mail look like a rounding error.

Certainly, the potential is there. The Internet undeniably brings many new and potentially wonderful educational capabilities — real-time, on-demand access, customization, personalization, multimedia and 24/7 availability from any browser. Then, of course, there are the huge economies of scale that could potentially bring the world's finest teachers right to your desktop at a tiny fraction of traditional costs — perhaps even for free.

DAVID MOSCHELLA is vice president of knowledge strategy at Means-Business Inc., an Internet start-up. Contact him at dmoschella@earthlink.net.

But haven't we heard all of this before? It's hard to avoid the unfortunate fact that virtually every major 20th-century media advance was accompanied by predictions about a coming revolution in education. I can certainly recall that being said about VCRs, cable TV, satellites, CD-ROMs and, of course, PCs. I strongly suspect the same was also said about radio, television and even the lowly tape recorder.

And yet, I don't think it would be too harsh to say that the net impact of all these technologies on traditional K-12 education, and even most forms of university education, has been just about zero. CD-ROMs, in particular, seemed to offer many of the same potential benefits that the Internet does today — on-demand access, multimedia, low cost and great economies of scale. But how many of us ever took serious advantage of any CD-based educational opportunities? Not me.

For whatever reason, since at least the time of Socrates, humankind has been unable to improve on the traditional teacher/student relationship. Perhaps there really is no substitute for the inspiration and motivation that a face-to-face experience can provide, and perhaps no test can match a good teacher's ability to sense whether a student is "getting it" or not. This says to me that traditional forms of school-based learning aren't in serious jeopardy.

Therefore, the primary e-learning opportunity isn't about replacing or reinventing education as we know it; it's about bringing real learning into the workplace and the promise of dramatic improvements in executive and employee education. Indeed, it's the familiar, even shopworn, phrases such as *continuous learning, life-long learning* and *the knowledge economy* that will determine the real future of e-learning.

And here, despite the gloomy precedents, you can count me in. The Internet is transforming just about every business task and function, and the current pace of change could easily continue for a decade or more. This convinces me that the great majority of workers will have to continually learn and relearn how to do their jobs, to a much greater extent than in previous eras. The only way this additional learning can be delivered practically is over the Internet.

Thus, the Internet is different from previous technologies, not just because it's a better educational tool but because by transforming commerce, it effectively creates its own demand. Unlike CD-ROMs and other media, the Internet dramatically increases the need for new learning, a demand only it can fulfill. With all due respect to the wonders of e-mail, John Chambers will be proved much more right than wrong. ◗

READERS' LETTERS

Scaling problem is with Oracle, not SQL 2000

THE ARTICLE "Microsoft Strikes Back With New Database Benchmarks" [*Computerworld.com*, July 27] should have pointed out that the SQL 2000 benchmarks were a whopping 89%, or 123,508 transactions, faster than Oracle's most recent benchmark performed on the most expensive industry hardware, at almost 25% of the cost.

Oracle has the scaling problem, not SQL 2000. Giga analyst Teri Palanca clearly hasn't read the entire TPM-C chart, or she would have seen how Microsoft SQL has scaled much higher than Oracle at a fraction of the cost. Microsoft SQL has the top 10 price/performance benchmarks, too.

What makes more business sense: Spend 75% less money and get 89% better performance, or go with the popular solution, quadruple your cost and get about half the performance?

Bob Moffat
Database administrator
Viacore Inc.
Orange, Calif.
btmx57@hotmail.com

MCSEs will benefit

I DON'T LIKE the cost, but I support Microsoft's decision to force MCSEs to recertify ["Users Criticize Decision to Halt NT Certification," Page One, Aug. 7]. In my training, many students relied on Internet brain dumps to pass the exams. This practice discredits those who worked hard to understand the material, and it may make employers to wary of certified applicants.

Michael Kuhn, MCSE
TRW Canada Ltd.
Saint Catharines, Ontario

Microsoft shouldn't shoehorn security

THE PROBLEM with Microsoft's security initiative ["Microsoft Security Executive Promises Improvements," News, July 31] is that it views security like any other operating system feature — something it can shoehorn in and put in a slide presentation. The reality is that security is about making sure all the other features don't do the things they're not supposed to be doing. Without this realization, Microsoft will continue to spend big bucks on security features and marketing, without actually improving the security of the average user's systems.

Chris Calabrese
Upper Montclair, N.J.
chris_calabrese@yahoo.com

About that belt idea

THE recommendation about wearing cell phones on a belt clip has me concerned ["CIOs Warned of Cell Phone Risks," Page One, July 31]. It seems to me that puts the radiation close to a part of the body that is near and dear to many people.

Paul Lourd
Greenwich, Conn.

Intangibles count

AS LONG AS hot companies expect 80-hour-plus workweeks along with unlimited loyalty, they will have to pay premiums ["Demise of the Skill Premium," Technology, July 31].

Divide the dollars by the hours worked, and these "outer limits of salary premiums" aren't very lucrative.

Most folks I know would be more than willing to sacrifice raw dollars, but *not* for dry cleaning or a campus atmosphere. We want to raise families and have a life. Companies that finally get that through their heads will succeed in the bonus strategy.

Let me know which companies are paying more than lip service to the "intangibles," and I will be the first to sign up.

Peter Jespersen
Lead systems engineer
Nike Inc.
Beaverton, Ore.
peter.jespersen@nike.com

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GEOFFREY JAMES

Want to work for a dot-com? Think before you leap

I KNOW A HOST of IT professionals who have left big companies to join dot-com start-ups. A few have made big bucks, but most are hopping from firm to firm, hoping to find the one that will make them millionaires. Even the financial problems encountered by the business-to-consumer dot-coms haven't dampened their enthusiasm much, as many have followed the trend toward business-to-business Web firms.

The quest for financial freedom isn't always a bed of roses, though. One friend ended up working for a Web infrastructure firm where the founder flipped out when the investors wanted to install a more experienced CEO.

"He ranted and raved, smashed pictures off the wall and called employees in the middle of the night to see 'which side they were on,' " she says. She's now working at another dot-com, with a CEO who is less intense.

GEOFFREY JAMES is the author of numerous books and articles on high-tech business. Contact him at www.geoffreyjames.com.

Another friend joined an Internet firm that paid him top dollar and sent him on great business trips, but the firm had a burn rate that consumed its working capital in two months. Yet another friend went to work at a company whose management thought that making deals and issuing press releases were substitutes for actually putting out a product. Both experiences ended with employees jumping ship before the businesses bit the dust.

I suspect that many IT professionals are experiencing similar difficulties in the wild and woolly world of the dot-coms. To help them out, I contacted Joseph Ferlazzo, director of corporate strategy at Andover, Mass.-based CMGI Inc., where he assesses the potential of Internet firms. I asked him what potential employees should look for in an Internet firm. Here's his timely advice:

- **Get ready to work longer hours.** If you don't want to be expected to attend a 7 a.m. breakfast meeting after you've been up all night reloading the Web site, then the dot-coms aren't for you.
- **Be risk-tolerant.** There is no such thing as job security inside dot-com firms, because the world of the Internet is constantly changing.
- **Be comfortable with the culture.** If you don't like the people or the work environment, don't join up. You'll be working long hours and it can be hell if you're not compatible.
- **Make sure that the company isn't just a bunch of concepts.** If you can't get to a level of detail about the product that's actually being sold, you're wasting your time.
- **Insist on seeing the company's business plan.** Walk away if they won't show it to you. The company should have a revenue stream and a date for when it expects to profitable. And there should be enough funding in place so that the firm won't run out of cash before it reaches that point.
- **Don't count your millions before they're hatched.** The time is over when you could count on making a bundle on the initial public offering, because the market is forcing Internet companies to adhere to the same business principles as traditional firms.

For those who are ready and willing to do the legwork before joining, a stint at a dot-com can still be an exhilarating and potentially profitable experience. But nobody wants to put all that time and effort into a company that never had a chance in the first place. ◗

MICHAEL GARTENBERG

Technology is fashion, so what are you wearing?

THE BENCHMARK of a successful analyst is how well you're able to predict the future and the quality of the advice you give on the strength of your analysis.

While I was at Gartner, my team wasn't wrong often, but here's one situation in which we totally missed the ball.

A vendor was briefing us in late 1997 and, as part of its pitch, presented the idea of launching a line of computers targeted at nontechnical users, particularly women and children. The systems would be available in a multitude of colors and shapes and marketed through venues such as *Vogue* and *Cosmopolitan* rather than traditional outlets such as industry trade magazines and computer stores. At the end of the vendor representatives' presentation, my colleagues and I were asked to evaluate the idea. Without any hesitation we responded with the tact that only a group of industry analysts can bear: "That's the dumbest idea we ever heard," "No one will buy a computer because it comes in five delicious fruit flavors." The vendor recanted the idea, and our analysis proved accurate — that is, until Steve Jobs and the iMac came along. Thus, technology as fashion was born.

MICHAEL GARTENBERG, former vice president and research area director at Gartner Group Inc., is a partner in Dellet LLC, a venture capital firm in Englewood, N.J., that focuses on the Israeli market. Contact him at michaelg@dellet.com.

Stylish Technology

It wasn't too long ago that all computers were created equal. PCs were PCs. If you wanted a server, you turned the box on its side. A workstation? You painted it black. If you needed a portable, you slapped a handle on the top. Today, technology is as much about fashion and style as it is about feeds and speeds. Companies such as Palm and Handspring trumpet not only the functionality of their systems but also the fine colors they come in or the fine-grained leather cases that can hold them, from vendors such as Coach and Dooney & Bourke.

The latest merging of fashion and technology is, of course, Palm's announcement of a special Claudia Schiffer version of the Palm V. Nearly every gadget you can think of today comes in translucent iMac-inspired colored plastic, prompting the age-old saying that beauty truly is in the eye of the beholder.

So what led to this? Why did fashion emerge and technology take a back seat to the superficial? First, as the benefits of Moore's Law became less relevant to users, vendors needed to differentiate systems any way they could. Second, the markup on accessories is huge. There's far more markup on a leather case for a Palm Vx than there is on a Palm Vx itself. Third, as in all markets, mature platforms tend to fragment. There's a reason we have 500 brands of toothpaste that all do the same thing and there's a reason you can buy just about any combination of technology gadgets in just about any form factor you like (with the exception of the shoe phone, which I have been patiently waiting for since 1968).

But Don't Forget Function

Business users need to pay attention to this trend as well. Users are increasingly technology savvy (just check the number of issues of *Computerworld* that come into your mail room and where they go) but even more fashion savvy. The number of requests for new systems that match decor or dress is climbing in ever-increasing numbers. Information technology organizations must realize that fashionable technology is often unsuitable for business use. Systems that flaunt fashion over function often aren't network-tested or certified for business use. Consumer systems and gadgets often lack the component standardization and support that business users need and should be avoided. As for me, I'm off to order a new Corinthian leather case for my personal digital assistant.

So what technology are you wearing this season? Send me your best technology and fashion stories, and I'll share them in an upcoming column. ◗

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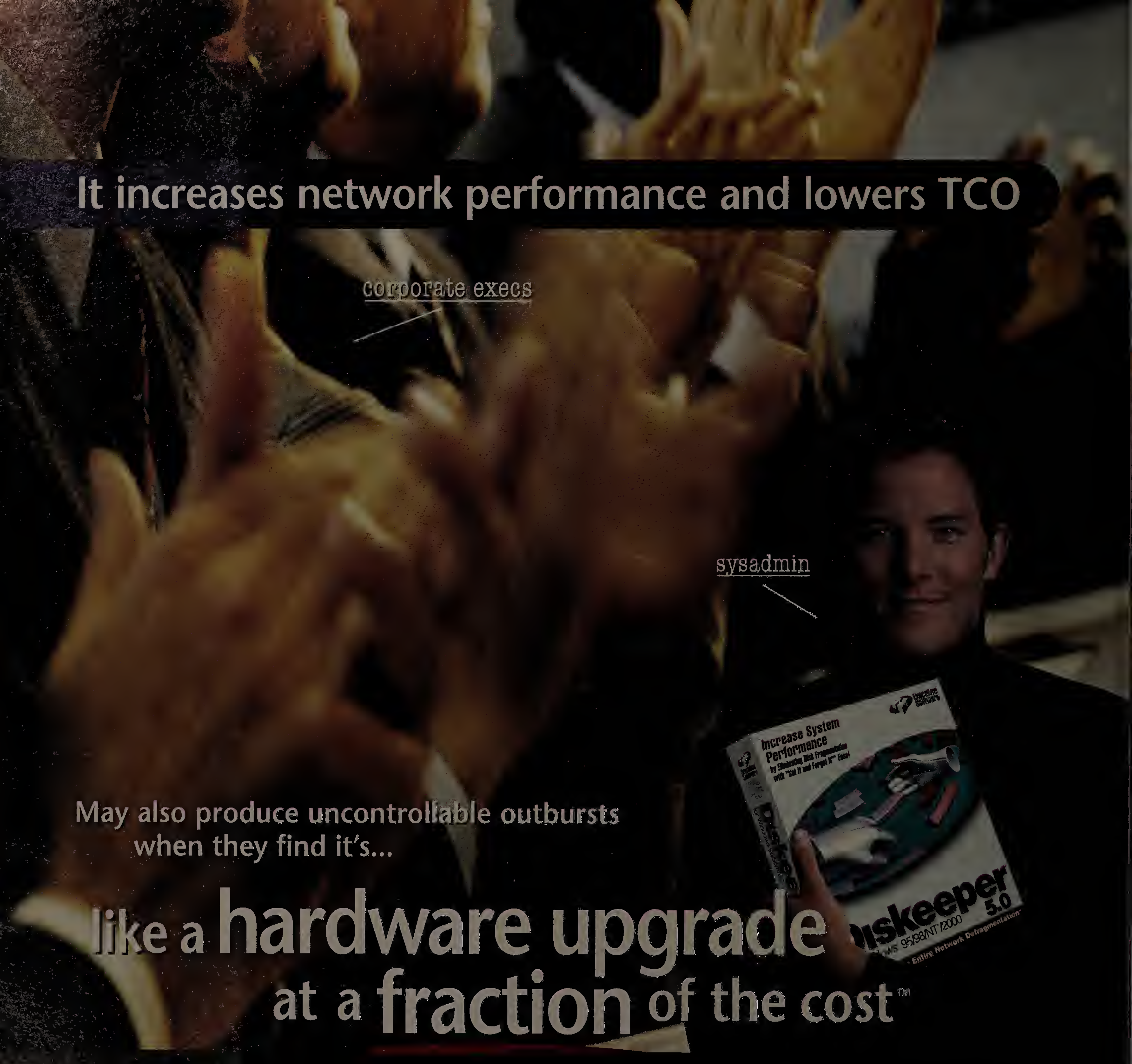
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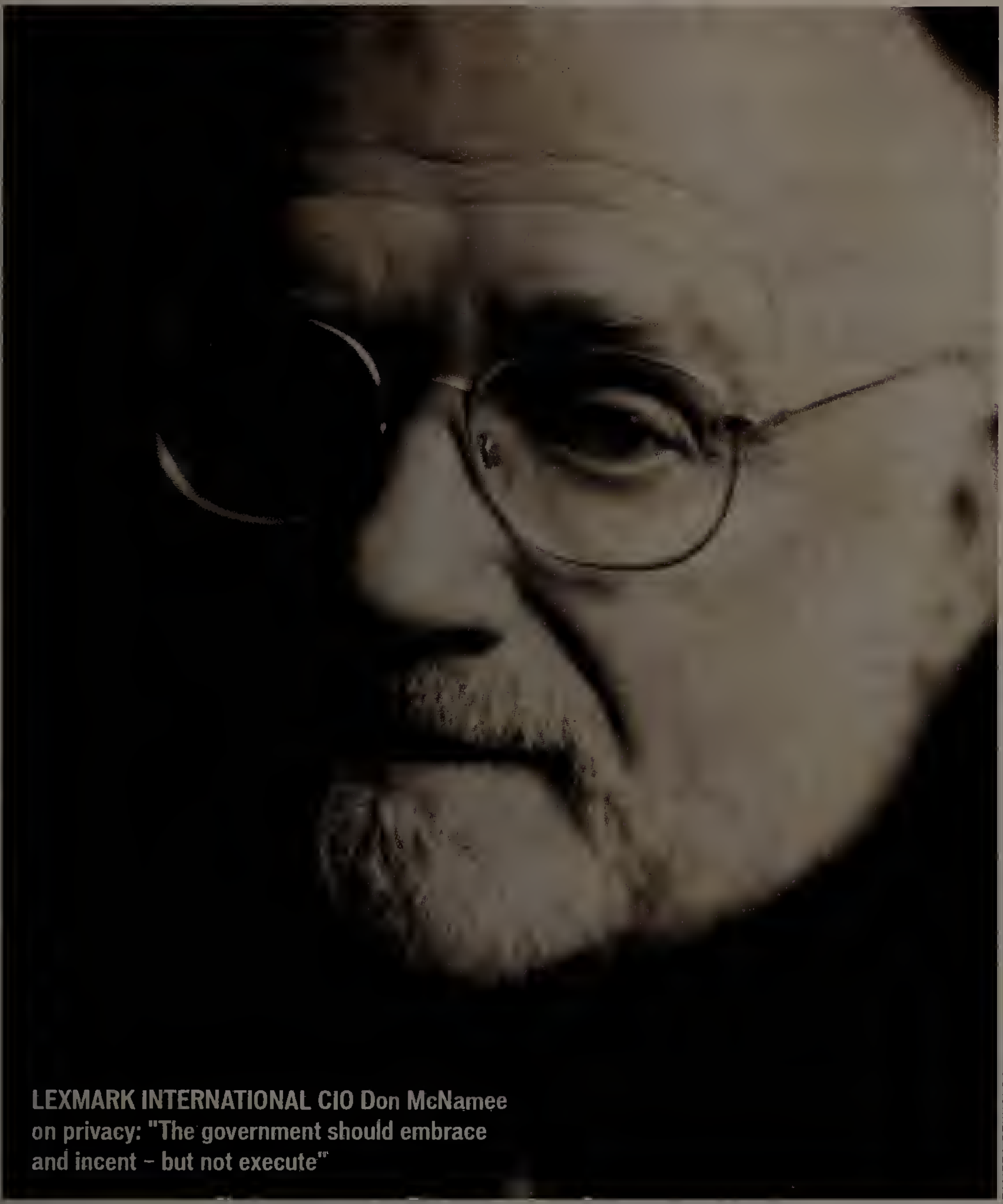


LEXMARK INTERNATIONAL CIO Don McNamee on privacy: "The government should embrace and incent – but not execute"

TAMERA REYNOLDS

Watching Washington

THE MICROSOFT CASE. ONLINE PRIVACY. H-1B VISAS. Internet taxation. Washington has certainly become involved in IT-related issues. And whatever the federal government does with these issues could very well affect your job, your company, even your industry. And both major-party candidates in this year's presidential campaign have staked out positions on IT issues. With all this and more in mind, *Computerworld* presents its annual Special Report on government and IT.

GOVERNMENT AND IT

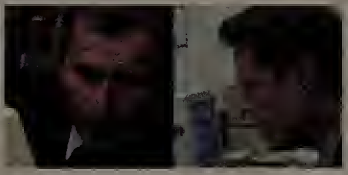
40

Don't Tread on IT!

Don McNamee, CIO at Lexmark International, says Washington should treat IT-related issues with kid gloves. He's not alone: A survey of 71 attendees at *Computerworld*'s Premier 100 Conference for IT Leaders in June found that most of his peers largely feel the same way. ▸ **40**

The Race for The Presidency

Vice President Al Gore and Texas Gov. George W. Bush have IT on their lists of campaign issues. They agree on the easy stuff, but they aren't taking stands on key technology controversies. ▸ **42**



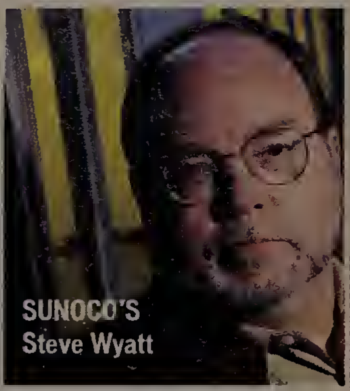
More H-1Bs?

Three bills are before Congress that would raise or eliminate the cap on H-1B visas for foreign workers, but not all IT managers and industry experts are embracing the proposals as solutions to the IT skills shortage. ▸ **46**

Sound Off

Raise the H-1B cap? Harris Miller of the Information Technology Association of America says yes because the current ceiling is inadequate. But Norm Matloff, a computer science professor at the University of California at Davis, says no, accusing employers of using the IT skills shortage as an excuse to import cheaper talent. ▸ **46**

Staffing



SUNOCO'S Steve Wyatt

KELLY CULPEPPER

Opinions of IT leaders like Steve Wyatt vary widely on what role the government should play in IT staffing issues, from providing tax incentives for training programs to sponsoring education initiatives, to just leaving well enough alone and staying out of the way. ▸ **48**

Big Brother Is Watching

The FBI's Carnivore spying system has drawn lots of attention from the media this summer. But a much more powerful system, called Echelon, has been drawing criticism from privacy advocates for years. ▸ **48**

QuickStudy

E-government. From the nation's capital to town halls, the public sector is discovering the many benefits of using the Internet. ▸ **50**

IN BUSINESS

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Don't Trea

The federal government has discovered the economic power of the IT industry. But corporate IT leaders would prefer that Washington apply no more than a light touch to such key issues as privacy and security — and let technology flourish. By Steve Ulfelder

DAMN THAT INTERNET.

The federal government managed to pretty much keep its mitts off the technology business for two generations. Then along came the Web, and computers turned sexy all of a sudden. Soccer moms were surfing the Net. Billionaires were popping up in this poky little not-quite-San Francisco section of California. One morning, sometime around 1997, every congressman in Georgetown woke up, took a deep breath and smelled the irresistible aroma of an industry throwing off wealth like nobody's business. And thus, an era came to an end.

The result: The federal government has rushed into technology in a big way, complete with laws, regulations, subcommittees and the Washington seal of authenticity: congressional hearings. And don't forget the antitrust case against Microsoft Corp., which could cause big changes for the information technology world. It doesn't get much more legitimate than that.

We were wondering which political issues are most important to IT leaders and what — if anything — the feds ought to do about them. So we asked you. At the June *Computerworld* Premier 100 Conference for IT Leaders, 71 attendees completed a survey on government and IT. Not surprisingly, security topped respondents' list of concerns, followed by data privacy and staffing issues (which are addressed in other stories, pages 46-49).

But whether Uncle Sam ought to worry about these issues is another question. Generally, IT leaders prefer a limited role for the feds.

SECURITY

Security was respondents' No. 1 issue, with 89% saying they are "very" or "extremely" concerned. Brian House, MIS operations manager and senior vice president at Greenville, N.C.-based Regional Acceptance Corp., says, "The business world in general is starting to take note that the information IT presides over is a mission-critical part of any organization and [that] the loss of revenue generated by theft could . . . send any company into a tailspin."

Despite this extreme concern, respondents called for the feds to play only a limited role (62%) or no role at all (14%) in addressing the security problem; only 21% called for a heavy role. Linda Rossetti, CEO of Boston-based eMaven Inc., an Internet strategy consulting firm, expressed IT's skepticism and posed the critical question.

"We're delighted for the [feds'] interest," she says. "But how solvable is the issue politically?" Rossetti says the data security problem is "less about control than it is about education" and adds that this education — on security practices and tools — is best left to organizations and IT departments.

Don McNamee, CIO at Lexmark International Inc., a Lexington, Ky.-based manufacturer of printers, says security has become one of his top concerns in the past year. "The government needed to recognize that security is a national problem," he says. "And they've done that." But McNamee says he doesn't believe the government ought to unleash legislation or create a bureaucracy. "[Federal] laws would just be another overhead position. And when you look at Los Alamos [the nuclear research laboratory in New Mexico, where recent security breaches occurred], they've proven that they have much to learn themselves."

But many respondents say the security problem poses so much risk that federal involvement is both necessary and inevitable. "Basically, I'm a free-market person," says Lew Leeburg, director of the information systems research program at University of California, Los Angeles' Anderson School. "But I recognize that we need government help against unscrupulous or criminal activities and people."

House agrees: "One of the main issues [facing IT] is the inability to prosecute hackers," he says. "Information theft must be stopped. Until we have laws in place . . . it will continue to be a problem."

And any such laws would have to be enacted and enforced at the federal level, respondents agreed; a state-by-state approach would be pointless. Alvin Boynton, manager of IT at Intranets.com Inc. in Woburn, Mass., a provider of free intranets to small businesses, says, "In [denial-of-service] attacks, the attacker might be in a different state or country, so to work, laws would have to be federal." Others joined Boynton in

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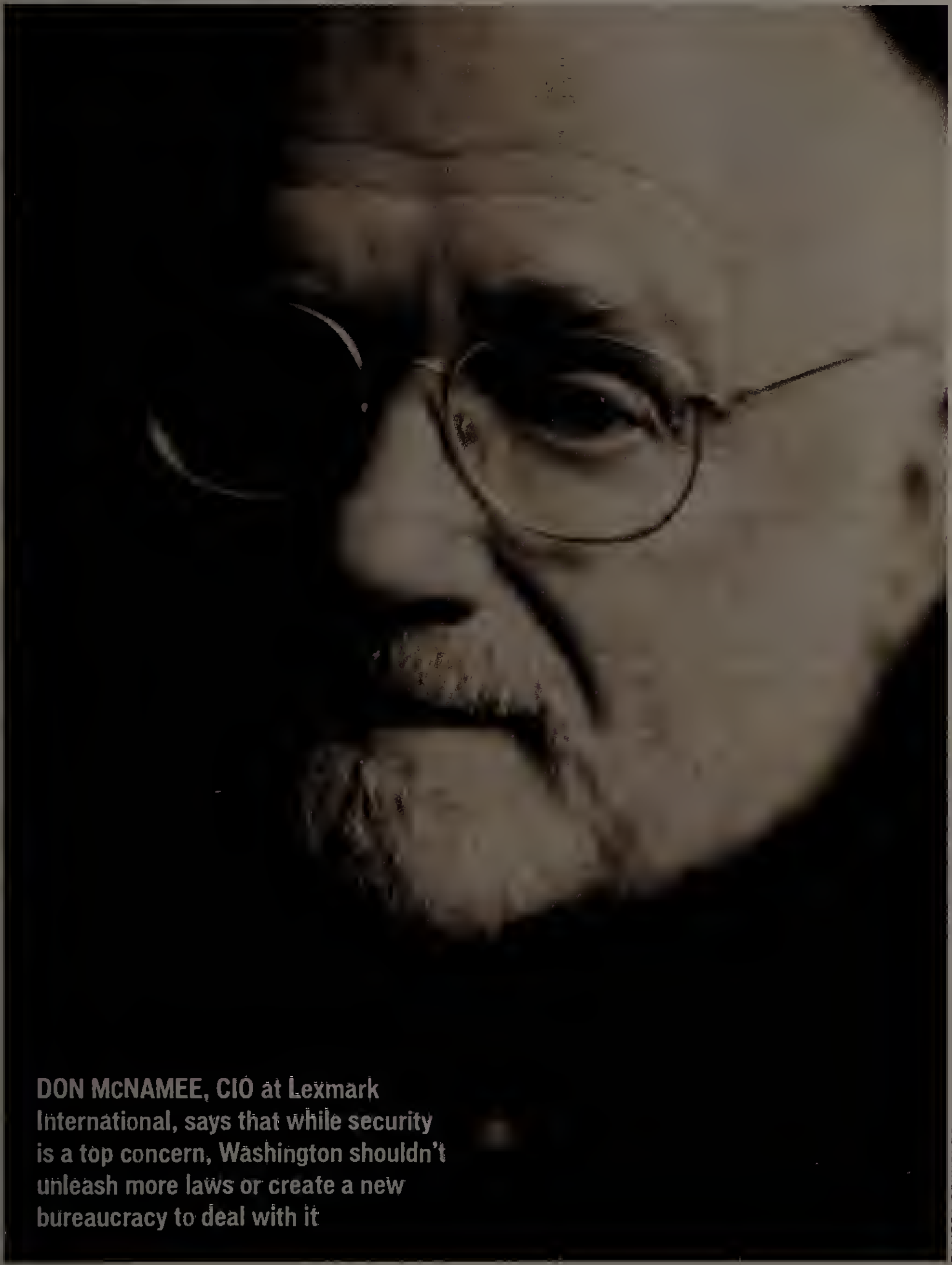
calling for more international laws and agreements. They point to the Love Bug, which caused an estimated $8 billion in damage worldwide in May, as an example; after college dropout Onel de Guzman was arrested in connection with allegedly writing the virus, the Philippines could charge him only with illegal use of passwords. Soon afterward, the Philippines enacted sweeping computer-crime laws. (All charges against de Guzman were dropped last week.)

IT leaders asking for federal and international data-security laws are apparently being heard. In June, Attorney General Janet Reno called for increased cooperation between law enforcement and industry, acknowledging the feds' shortcomings, according to a *Computerworld* report [News, June 19]. On the international front, various global groups, including the Group of Eight nations and the Council of Europe, are pressing for treaties that address data and computer crimes. IT leaders applaud such global efforts.

> Until we have laws in place . . . [information theft] will continue to be a problem.
>
> LEW LEEBURG, DIRECTOR, IS RESEARCH PROGRAM, UCLA'S ANDERSON SCHOOL


DON McNAMEE, CIO at Lexmark International, says that while security is a top concern, Washington shouldn't unleash more laws or create a new bureaucracy to deal with it

TAMERA REYNOLDS

PRIVACY

Online privacy is a solid-gold issue for election-year pols. This may explain a recent flurry of proposals and photo ops. Despite being several years old, Carnivore — an e-mail surveillance tool developed by the FBI — has recently come under fire from a group that includes the American Civil Liberties Union and some Republicans.

A bipartisan group of congressmen recently introduced legislation in the Senate and House that would keep businesses from secretly monitoring employees' e-mail, Internet surfing habits and other computer use. And in June, a House subcommittee created a 17-member commission to study, among other things, consumer privacy on the Internet.

A month later, four senators — two Republicans and two Democrats — filed legislation that would require all commercial Web sites that collect personally identifiable information to provide consumers with clear and conspicuous notice about their information collection practices.

For IT leaders, privacy is not as pressing an issue as data security — but it's pressing nonetheless: 66% of survey respondents said they're "very" or "extremely" concerned about privacy. Fifty-five percent of respondents said the government should play a "limited role" in addressing the issue, 27% would prefer a "heavy role," and 15% said the feds should play "no role." Many echoed McNamee, who says, "I'm not sure the feds should be doing much about [privacy], but they could provide guidance. The government should embrace and incent — but not execute."

Continued on page 42

d on IT

MONEY& POLITICS

It's been said that money is the mother's milk of politics, and the IT industry has done its share of feeding both major political parties. Here's what we found on the Web site of the Center for Responsive Politics (*www.crp.org*), a Washington-based nonpartisan, nonprofit research group that tracks money in politics and its effect on elections and public policy.

According to the CRP, "soft money" is given to political parties' "nonfederal accounts," which fall outside of the legal, "hard money" limits on contributions to federal candidates.

Top Soft Money Contributors, 1999-2000

The top 10 IT companies, based on filings with the Federal Elections Commission as of July 1, and how they split that money between the two major parties. (Includes donations from individuals affiliated with the companies.)

	TOTAL	DEMOCRATS	GOP
1. AT&T Corp.	$2,212,719	41%	59%
2. Microsoft Corp.	$1,322,890	43%	57%
3. SBC Communications Inc.	$1,062,753	63%	37%
4. Verizon Communications	$954,846	42%	58%
5. BellSouth Corp.	$641,517	49%	51%
6. WorldCom Inc.	$486,610	19%	81%
7. US West Inc.	$471,100	32%	68%
8. Global Crossing Ltd.	$440,000	45%	55%
9. America Online Inc.	$433,075	35%	65%
10. Oracle Corp.	$381,350	21%	79%

SOURCE: CENTER FOR RESPONSIVE [illegible] WEB SITE (WWW.CRP.ORG)

IT and the Run for the W

Bush and Gore include IT in their lists of campaign issues but avoid taking stands on key technology controversies.

By Patrick Thibodeau

WHEN IT COMES to high-tech issues, Vice President Al Gore and Texas Gov. George W. Bush, agree on the easy things, such as research and development tax credits and H-1B visas, while ducking the hard issues, especially online privacy protection and Internet taxation.

It's part of the formula for winning the presidency and not alienating the high-tech vote.

Bush has surrounded himself with an elite group of policy advisers organized into a high-tech council. That group includes Dell Computer Corp. Chairman Michael Dell, Intel Corp. founder Gordon Moore, former Netscape Communications Corp. CEO Jim Barksdale and Robert Herbold, Microsoft Corp.'s executive vice president and chief operating officer.

The Bush campaign says it has a strong grip on high-tech support. "Based on the kind of people that we have involved — I'm not sure who is left," says Steve Papermaster, president and CEO of Agillion Inc., an Austin, Texas-based Internet application developer, who's on Bush's technology advisory committee.

The Gore campaign doesn't have anything as organized as the Bush camp. But citing Gore's deep roots on technology issues, the vice president's people say they don't need it. "The Gore campaign has felt that they've had a network in [Silicon] Valley for a long time," says Jeff Modisett, deputy CEO and general counsel for the Democratic National Convention.

TREADING LIGHTLY

Both candidates are walking carefully on high-tech issues: neither is pushing for comprehensive privacy legislation. And don't expect either side to take a stand on online sales tax collections — it may be a poison pill.

Supporting the collection of online sales taxes by companies in jurisdictions where they now don't have any obligation "may have the appearance of favoring a new tax," said James Goldberg, the Washington counsel for the North American Retail Dealers Association, which wants online businesses to have the same tax collection obligations as physical stores.

And both candidates have have created problems for themselves with the way they have handled the privacy issue.

Robert Ellis Smith, editor of *The Privacy Journal*, ranked Texas last among states for privacy protections in a study he conducted last fall. While privacy legislation is "more of a product of the legislature than the governor," says Smith, "it certainly shows the environment that [Bush] comes from."

In 1994, Gore supported the so-called clipper chip, a "key escrow" system that would give the government access to encrypted messages. That plan drew considerable opposition, not unlike the concerns being raised about the FBI's proposed Carnivore system that could give law enforcement officials access to e-mail.

Gore is pushing for strong financial and medical privacy protection, and Bush is also stressing the importance of privacy. But don't expect specifics, say experts. "The high-tech industry right now doesn't want the legislation, and both parties are aggressively courting the high-tech industry," said Marc Rotenberg, executive director of the Electronic Privacy Information Center in Washington.

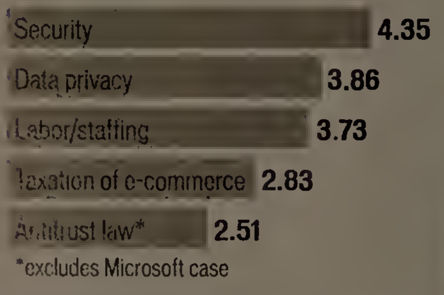
Some of the issues that may be most important to companies may never

Washington Watch

Here's what a Computerworld *survey of IT leaders revealed on attitudes toward high-tech issues before the federal government:*

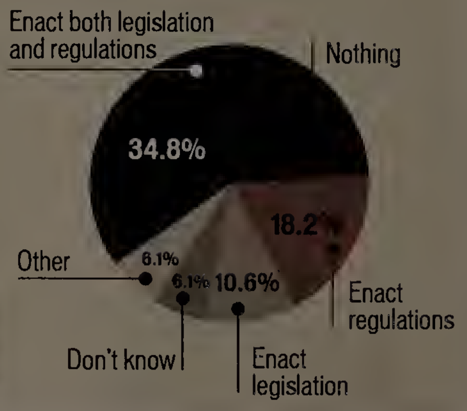
As an IT leader, what degree of concern do you have on these issues, ranked from 1 (not at all concerned) to 5 (extremely concerned)?

ANSWERS ARE AVERAGES



*excludes Microsoft case

What should the government do with regard to privacy of online data?



SOURCE: *COMPUTERWORLD* SURVEY OF 71 ATTENDEES AT THE PREMIER 100 IT LEADERS CONFERENCE HELD JUNE 19-21 IN DESERT SPRINGS, CALIF.

Continued from page 41

"When it comes down to it, there has to be a base level of regulation for this," says Boynton. Referring to the practice of monitoring employees' computer use, he says, "I spend 12 to 14 hours a day in this office. With your best employees . . . if you expect dedication, it's not fair to look over their shoulders." Boynton says he believes that at least some moderate federal involvement to prevent such snooping is reasonable.

Rossetti often runs into privacy issues because some eMaven clients are large health care companies. She, too, says she believes some regulation is acceptable. "We need specific rules of engagement for companies that are collecting and using online information [about consumers]," she says. "There need to be some boundaries set."

Rossetti says lawmakers should practice restraint by asking this question: "Are we putting restrictions on digital-world companies that aren't on physical-world companies?" Experts point out that even in the off-line world, there's voluminous demographic and purchasing history available on just about any cross-section of consumers you can name. It would be unfair, they say, to hobble online data-gathering while ignoring the off-line component.

But many IT leaders say they don't trust the government and add that industry can do at least as good a job at discouraging invasions of privacy.

"That policing authority is scary," says Don Halverson, president of Salt Lake City consulting firm Systems West Computer Resources Inc. "You get info passing through a lot of hands — that's another opportunity for loss."

Those who adopt this skeptical view look at recent losses of Department of Energy laptops, complaints that Internal Revenue Service audits have been used as weapons against the political enemies of those in power and a general mistrust of those inside the Beltway and conclude that the feds are the last people to be trusted with sensitive data.

"If you have the authority to get information from someone, you have the responsibility to take care of it. If you abuse the privilege, you've got to get your hand slapped. Same goes for the government," Halverson says.

TAXES

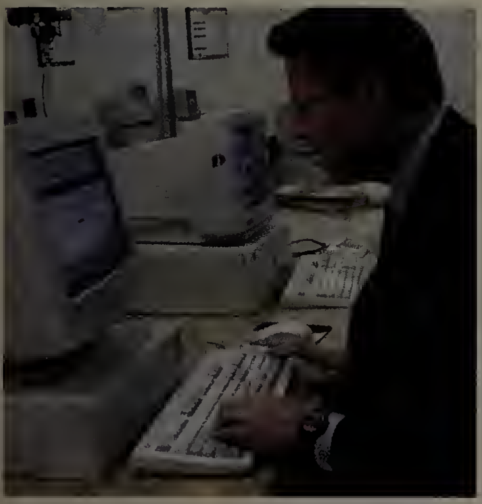
When asked whether Internet transactions ought to be taxed, a full 68% of the survey respondents said no.

"I would be for minimum government intervention on the commerce side, including no taxation," says Leeburg.

"I think taxes are evil," adds Halverson, only half-joking. He softens that — sort of — by adding, "I know the government needs to get money somewhere, and I know the government does things for me. I think they do a little too much."

"We have all these surpluses now, so much prosperity, and it's driven by the

hite House



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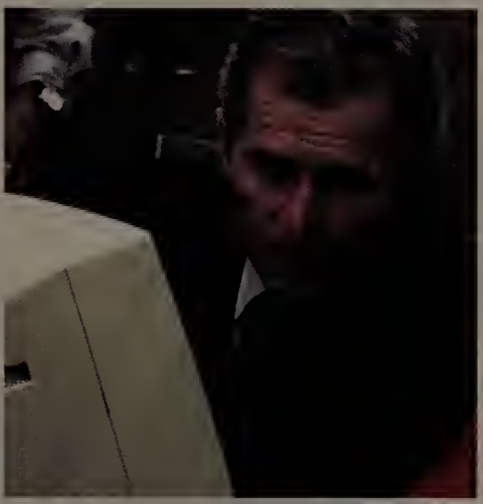
> **Many leading IT companies are working to expand the number of American workers with IT skills. . . . I urge other high-tech firms to do more to ensure that America has the best IT workforce in the world.**

AL GORE, IN A *COMPUTERWORLD* INTERVIEW, JUNE 29, 1998



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> **[Creativity, enterprise and risk-taking] are the hallmarks of the high-tech industry, where the great engine of wealth has become the human mind – creating value out of genius.**

GEORGE W. BUSH IN A *COMPUTERWORLD* COLUMN, AUG. 9, 1999

make it to the surface during the campaign. Take information security: The Clinton administration has been working to build a public/private partnership on improving the nation's information security infrastructure, most of which is in private hands. But despite such a call, regulatory agencies could begin requiring tougher security controls in the companies they oversee.

"Where the differences may actually show up between the two administrations, philosophically, could be at the regulatory level," says Rhett Dawson, who heads the Information Technology Industry Council, a trade group in Washington. But he says it's hard to predict what either candidate might do.

One area of difference may be the Microsoft antitrust case and antitrust enforcement in general.

Gore hasn't been critical of the U.S. Department of Justice's case. Bush, perhaps cognizant of a deep split among high-tech leaders on the issue, has avoided saying anything explicit about it. But with Microsoft's Herbold as part of the inner circle, a Bush administration is seen as potentially more willing to settle, if not outright scuttle, the case. "I think it's fair to say that the people who surround George Bush might not be as activist in a range of antitrust cases," said Ken Wasch, president of the Software and Industry Information Industry Association, which has supported the government's lawsuit. ▶

Internet," Boynton says. "Add it all up, [and] it seems the lack of tax is helping the economy, not hurting it."

The U.S. has a moratorium on Internet sales taxes at least until October of next year. Backers (and would-be extenders) of the moratorium say it will help speed the growth of e-commerce. Opponents argue that it amounts to an unfair penalty on traditional stores and that states should be free to form their own policies.

IT leaders generally think an unlevied tax is the best tax of all. Several point to jurisdictional issues. "It would put U.S. sellers at a big disadvantage," Halverson says. "People can go outside the U.S. for goods and services."

Rossetti is sympathetic to both points of view, because eMaven clients tend to be large corporations that feature both brick-and-mortar channels and Internet operations. "It's tough for companies with multiple outlets," she says. "We should avoid taxation of commerce as long as possible to get more people to jump [into e-commerce]. But what message is nontaxation sending them? I mean, do you want companies to shut down stores?"

Some IT leaders call for the government to stop thinking about the revenue side — that is, taxes — and instead focus on using IT to trim costs. "I don't think the government is motivated to control their costs the way we [in industry] are," says McNamee. "They should embrace technology to realize operational efficiencies. If they do that, the tax issue goes away."

ELECTIONS

The 2000 political season is rare in that both the White House and majority control of Congress are up for grabs. The race for the White House between Vice President Al Gore and Texas Gov. George W. Bush is expected to be tight, and the Democrats, though facing an uphill battle, hope to recapture the Senate and House after six years of Republican control.

For their part, IT leaders surveyed expressed no strong tilt toward either party. Rossetti sums up the attitudes of many when she says, "The Net is such a motherhood-and-apple-pie topic, we're not worse off either way."

Conventional wisdom holds that a prosperous economy bodes well for an incumbent administration. And despite this year's roller-coaster stock market, you'd be hard-pressed to find a field more prosperous than technology. Boynton, who says he's registered as an independent voter, says: "As a Gen Xer, in the last eight years, I've had opportunities I never thought I'd have in my life. . . . The past five or six years have been very good for me and for everybody I know."

On the other hand, many survey respondents said they would prefer the laissez-faire approach associated with the Republican Party. "I think that if Bush is elected, we will see fewer laws, but these laws will certainly be more effective," House says.

Traditionally, the technology world hasn't had much patience with politicians from either side of the aisle. In the final analysis, many IT leaders say they would prefer that the feds simply stay out of the way.

John W. Oster II, a vice president at ADP Dealer Services in Rockville, Md., a provider of transaction systems for the auto industry, says, "The government really needs to become introspective with respect to problem solving to avoid becoming a hindrance to the implementation of technology." ▶

Ulfelder is a freelance writer in Southboro, Mass. Contact him at sulfelder@charter.net.

MONEY& POLITICS

Campaign Contributions

Here's what companies from two technology-related industries have donated to this year's presidential campaigns (as of July 1):

COMMUNICATIONS/ELECTRONICS	
George W. Bush (Republican)	$2,654,180
Al Gore (Democrat)	$2,088,776
Pat Buchanan (Reform Party)	$44,218
Ralph Nader (Green Party)	$25,521
Harry Browne (Libertarian)	$29,600

COMPUTER EQUIPMENT & SERVICES	
Bush	$879,299
Gore	$412,196
Buchanan	$17,150
Nader	$5,400
Browne	$16,950

SOURCE: CENTER FOR RESPONSIVE POLITICS WEB SITE (*WWW.CRP.ORG*)

Lobbying By Top IT Companies - 1998

In 1998 (the last year for which figures are available from the CRP), IT-related companies paid nearly $39 million to help influence legislation in Washington. Here are the companies that spent more than $1 million on lobbying that year:

IBM	$5,312,000
Microsoft	$3,740,000
EDS	$3,310,070
Texas Instruments	$2,260,000
Oracle	$1,900,000
Compaq	$1,197,000
Sun Microsystems	$1,180,000
Intel	$1,100,000
America Online	$1,020,000
Business Software Alliance	$1,020,000
Computer Systems Policy Project	$1,020,000

SOURCE: 1998 LOBBY DISCLOSURE REPORTS AND AMENDMENTS FILED UNDER THE LOBBYING DISCLOSURE ACT OF 1995, THROUGH THE CENTER FOR RESPONSIVE POLITICS (FROM *WWW.CRP.ORG*)

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one billion bytes when referring to storage capacity, accessible capacity may be less. [4]Estimated reseller price to end users model 6643-13U. Actual reseller prices may vary. PCs referenced in this ad include an operating system. NetVista and IBM product

Should the H-1B Cap be

ITAA President Harris Miller and Prof. Norman Matloff square off on the extent of the information technology labor shortage and the need for more foreign IT workers.
By Joanie Wexler

> **We need to bridge the skills gap through this adjustment period . . . and one way to do so is to bring in more skilled foreign workers.**
>
> HARRIS MILLER, PRESIDENT, INFORMATION TECHNOLOGY ASSOCIATION OF AMERICA

Yes!

HARRIS MILLER, president of the Information Technology Association of America (ITAA) in Arlington, Va.

SOUND OFF

THE U.S. is undergoing an Internet revolution, which has created an extraordinarily rapid demand for IT skills. There are currently 845,000* vacancies for IT workers in this country. We need to bridge the skills gap through this adjustment period while we revamp education and training programs, and one way to do so is to bring in more skilled foreign workers.

The H-1B visa cap has so far proved inadequate. This year, we ran out of available H-1B visas in March. If Congress fails to extend the cap, the losers will be U.S. companies and U.S. workers, because companies will start taking projects offshore.

Opponents argue about protecting American jobs and wages, but the H-1B visa program accounts for just one-tenth of 1% of the overall U.S. workforce.

We're competing in a global economy, and if, at the end of the day, we let India, Ireland, the Philippines and South Africa take jobs away, we will eventually see not only partial movement of projects offshore but wholesale movement. Our global dominance will wane. It's inexpensive to move an IT operation abroad, and it's a myth that the only smart people in the world live in the U.S.

Long term, the U.S. must commit to having students in schools studying many more hours per year. Our best universities and students are the best in the world, but our average universities and students have to compete, too.

We need year-round schools or longer school days, with more time mandated in math and science courses, if kids are going to be ready for a 21st century workforce. In addition, colleges and universities, which traditionally are slow to change, need to en-

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Foreign Affairs

Despite three pending bills to raise or eliminate the cap on H-1B workers, not all IT managers and industry experts are embracing them as solutions to the high-tech skills shortage. By Joanie Wexler

STAFFING

THE RAPID PROLIFERATION of the Internet, the preponderance of fast-growing start-ups and the rush to build e-commerce arms for established businesses are quickly draining the available pool of information technology talent in the U.S. However, predictions differ about the looming impact of the IT skills shortage.

Industry lobbyists predict that if Congress doesn't increase the number of immigrant IT workers allowed into the U.S. under the federal H-1B program, the country will face an economic crisis as early as next year.

IT managers at user companies and other observers in nonvendor firms say they agree that the H-1B visa program has its place as one means of attracting the best and brightest IT talent to America. But, they say, they also see other short-term options for filling specific expertise gaps. They also advocate on-the-job training for the long haul.

THE INDUSTRY PERSPECTIVE

Lobbyist associations for computer companies predict dire consequences if the H-1B visa cap — currently set at 115,000 workers per year — isn't extended soon, at least on a temporary basis. Industry lobbyists warn that U.S. firms will likely begin moving IT projects to other nations, where the required talent is available.

"This could pose a threat to the livelihood of the American IT worker and the U.S.'s leadership position in IT," says Jeff Lande, vice president of the Information Technology Association of America (ITAA) in Arlington, Va.

In a study released in April, the ITAA claimed that this year employers will create a demand in the U.S. for about 1.6 million technology-related workers. The ITAA estimates that half of those positions (or one in 12 existing positions overall) will likely go unfilled.

Similarly, the Computing Technology Industry Association (CompTIA), a Lombard, Ill.-based association of technology companies, surveyed 878 CIOs and other IT executives last year. The group found that almost 10% of IT jobs are currently unfilled.

"What was once seen as a problem for Silicon Valley, Boston and Austin is now a problem for the entire country," says Grant Mydland, manager of government relations at CompTIA.

Mydland is also director of the Technology Workforce Coalition, an Arlington, Va.-based industry alliance pushing for federal and state tax incentives and other programs to address the shortage. "The skills deficit is no longer just a problem for IT companies," Mydland says. "Because of the Internet, it has spilled over to IT-enabled [user] companies as well."

THE USER VIEW

Corporate IT managers working at user companies acknowledge that finding affordable talent isn't easy. But they

aised?

hance their computer science programs and lab resources. ◗

* Figure based on an ITAA 2000 study

The ITAA provides public-policy leadership on behalf of 400 direct corporate members and 26,000 affiliate members.

No!

NORM MATLOFF, professor of computer science at the University of California at Davis

THE GOVERNMENT should drastically reduce the H-1B visa cap. My reasoning has to do with the vast majority of IT job applicants within this country who are already being turned down.

H-1B visa holders in the high-tech field work almost exclusively as programmers, not in other IT jobs such as marketing, customer support, software testing and so on.

But employers hire only about 2% of people who apply for programming jobs at their companies. They acknowledge that they reject the vast majority of applicants without even an interview. If employers were desperate, they couldn't afford to be so picky.

When you talk with some of these employers, you discover that they're not really finding that there's a shortage of IT talent. Rather, they're finding a shortage of IT talent at a wage they want to pay and, specifically, a shortage in work experience with Java, SAP and other specialized programs.

But there's a chicken-and-egg element to this: If on-the-job experience in these programs is as scarce as employers would have us believe, the laws of supply and demand say that skilled workers in these areas should be able to charge a premium for their services.

If employers don't want to pay the market price, they should be willing to train competent programmers in specific programs — an investment that would take only a matter of weeks.

Insincere employers use the shortage of program-specific experience as an excuse to hire younger Americans or foreign workers who are less expensive. The sincere employees have bought into this need for these specific skills and may honestly not realize that any competent programmer can quickly pick up a new program.

I fully support bringing in the best and the brightest workers from around the world, which was the intention of the H-1B program. But that's a small fraction of the workers we need — maybe about 10,000 people per year. ◗

> **Insincere employers use the shortage of program-specific experience as an excuse to hire . . . foreign workers who are less expensive.**
>
> NORM MATLOFF, PROFESSOR OF COMPUTER SCIENCE, UNIVERSITY OF CALIFORNIA AT DAVIS

Matloff says his research into the H-1B controversy stems from his interest in age discrimination issues.

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also seem more willing to get creative in finding a solution rather than importing more workers.

"One year ago, I was very apprehensive about my company's ability to attract and retain talented workers in a small South Carolina town," says Steve Wyatt, director of IT corporate services at Sonoco Products Co. in Hartsville, S.C. "But we re-evaluated and upgraded our compensation, bonus and training packages. We found we were then able to attract talent from major metro areas. And I have no job openings at the moment."

Wyatt says that when he needs a new skill set quickly, he turns to consultants, who seem to be readily available. "But you need to build skills in-house so you are not held hostage to this expensive alternative," he notes. "In the short term, though, it is just part of the cost of doing business."

Still, Wyatt says, he isn't opposed to the availability of H-1B visas. In fact, he adds, the cap should be lifted to enable a "natural ebb and flow" of worker demand and availability.

"Workers go where the demands are," Wyatt says. "If we're not paying enough, they probably won't come here." ◗

Wexler is a freelance writer in Campbell, Calif.

ALAIN PILON

H-1B IN BRIEF

H-1B visas are issued to foreign professionals who want to work in the U.S., primarily in engineering, computer science, biotechnology, marketing and health care. An H-1B visa holder can work in the U.S. for up to six years and must hold the equivalent of a bachelor's degree or higher.

Approximately 60% of H-1B visa holders work in computer-related jobs, according to the U.S. Immigration and Naturalization Service. Workers functioning in a programming capacity fill most IT jobs for which H-1B visas are sought.

The maximum number of H-1B visas allowed annually was raised from 65,000 per year to 115,000 per year for last year and this year, at the urging of the computer industry. Without further amendments, the cap is slated to be reduced to 107,000 in fiscal 2001 and to 65,000 in fiscal 2002.

Three bills aimed at raising or eliminating the H-1B visa cap are before Congress. Two would raise the cap to about 200,000 per year for the next few years. The third would eliminate the cap but contains several caveats concerning minimum salary requirements, which the industry opposes.

The Feds' Role: Take Charge or Butt Out?

Opinions vary widely on the government's role in IT staffing issues, from providing tax incentives for training programs to sponsoring educational initiatives to just plain leaving well enough alone. By Joanie Wexler

STAFFING

JUST WHAT ROLE — if any — should government play in providing relief to the information technology labor shortage with work visa programs, training, education tax credits and the like?

"Government shouldn't hinder progress in any way," says Mark Dundore, director of applications development at Princess Cruises Inc. in Valencia, Calif. Dundore acknowledges that "the need for IT talent is exploding, and the availability is pretty dismal."

Dundore says that at their core, incentives such as H-1B visas, which are used to bring in talent from other countries, are a positive move, and "many IT workers would likely agree. They're buried. Companies are doing more with less. There is enough work for everybody," he says.

But Dundore adds that even with the best of intentions, government efforts to help often backfire. "Government can get bogged down in red tape and can find itself swayed by big business," he says. "The IT situation will resolve itself as it goes through its cycles. There are 9-year-olds out there today flying through Windows."

Norman Matloff, professor of computer science at the University of California at Davis, says he's strongly opposed to government training programs, "because they don't work, and they are not necessary." Rather, he says, he encourages employers to hire generic programmers, not programmers with specific software skills, who can learn new programming on the job, without a formal training program.

"Any competent programmer can become productive in a new programming language in a couple of weeks. If a given programmer cannot do that, then he is not good enough to hire in the first place," Matloff says.

Not all IT managers see a need to increase the number of H-1B workers. Steve Wyatt, director of corporate services at the IT group at Sunoco Products Co. in Hartsville, S.C., says contractors can usually fill job needs while a company retrains existing employees.

Some U.S. workers say government incentives such as the H-1B visa program tend to fuel discrimination.

"I think H-1B numbers should definitely not be increased and preferably should be decreased," says Luciana Messina, founder of Software to Spec Inc., a maker of real-time embedded systems in Palo Alto, Calif. Before starting the company, Messina quit her full-time software-engineering job at an IT company in protest when she saw well-qualified computer professionals over the age of 40 unable to find work.

"H-1B is serving as a crutch so employers don't have to address the real problem, which is that people need to

---

Intercepting Messages

While the FBI's Carnivore spying system has garnered media attention, a more insidious surveillance system may already be in place.

By Mathew Schwartz

ECHELON

EVERYONE IN CONGRESS seems to be proposing new legislation for Carnivore, the FBI's black-box system for wiretapping — with a court order — the communications of a suspect in a criminal case through that person's Internet service provider.

But for years, privacy advocates have been complaining about a much more powerful global network named Echelon. Run by the U.S. and its allies, Echelon is able to intercept and decrypt almost any electronic message sent anywhere in the world. What ruffles the feathers of privacy advocates is Echelon's potential for misuse, because it intercepts both sensitive government data and corporate information.

Echelon appears to have been in operation since the 1980s, but it wasn't until the 1990s that journalists such as Duncan Campbell and scholars using the Freedom of Information Act were able to piece together a rough picture of how it works.

Essentially, Echelon is a massive keyword-checking system that's able to reference any form of written — and possibly many types of spoken — communication. Its effectiveness lies in the fact that it taps into the major channels across which information is sent globally: fiber-optic cables, satellite ground-receiving stations and spy satellites.

By January 1998, revelations about the massive scale of Echelon's interception of information led the European Union to commission a report, "An Appraisal of Technologies of Political Control" (*http://cryptome.org/stoa-atpc.htm*). The report analyzed Echelon and asked whether it was a threat to Europeans' civil liberties.

Last September, the EU released a report blasting the UKUSA — an alliance of the U.S., U.K., Canada, Australia and New Zealand — for using Echelon to intercept confidential company information and divulging it to favored competitors to help win contracts. The report alleged that Airbus Industrie in Blagnac Cedex, France, lost valuable contracts because of information intercepted by Echelon and used by The Boeing Co. in Seattle to obtain a competitive advantage.

TECHNICAL CAPABILITIES

How will companies know if their communications are being monitored by systems such as Echelon? They won't.

Potentially, the system can intercept almost any electronic communication and then check it against various dictionaries containing keywords of interest.

Despite the hype, a senior CIA official speaking on condition of anonymity says systems such as Echelon don't have enough computing power to effectively sort through everything intercepted. Often, technology is the least of the agency's concerns. Since we can't process anywhere near the volume of stuff that people generate, we need a hint about what to go after," says the official.

Campbell, a pioneer in Echelon reporting, says he believes that Echelon has no problem with written materials but that the science of speech recognition isn't advanced enough for a real-time global listening system to transcribe hundreds of thousands of simultaneous calls. What Echelon is able to do, he asserts, is voice-pattern matching, to detect who is speaking.

Supposedly, the National Security Agency (NSA) had a hand in designing Echelon. What troubles many is that

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ABOUT YOU

❷ What is your primary job title? *(Check one only)*

Information Systems/Technology/Engineering Mgmt.

- ☐ 01. CIO, CTO
- ☐ 02. Vice President
- ☐ 03. Director, Manager, Supervisor
- ☐ 04. Other IS/IT Manager

____ please specify

- ☐ 05. IS/IT Staff (Including Software/Tech. Engineer)

Corporate/Business Management

- ☐ 06. CEO, COO, Chairman, President
- ☐ 07. CFO, Controller, Treasurer
- ☐ 08. Executive Vice President/General Manager/ Director
- ☐ 09. Department Manager
- ☐ 10. Other Corporate/Business Manager (Including Mfg.)

____ please specify

- ☐ 11. Corporate/Business Staff

Professional Management

- ☐ 12. Consultant
- ☐ 13. Systems Integrator
- ☐ 14. Other Professional Manager

____ please specify

- ☐ 15. Other (Non-Manager) ____

❸ Are you responsible for the acquisition and implementation of technology-based solutions to enhance business performance in your company? (or your clients if you are a consultant)

☐ 01. Yes ☐ 02. No

❹ Are you involved in setting the business/ technology trends for your company? (or your clients if you are a consultant)

☐ 01. Yes ☐ 02. No

5a What is the TOTAL annual dollar value of computing/networking/communications equipment and software/services, which YOU are currently or will be involved in purchasing? Consultants: Please include what you recommend for your clients as well as what you buy for your own business. *(Check one only)*

- ☐ A. $100 million or over
- ☐ B. $50 to $99.9 million
- ☐ C. $25 to $49.9 million
- ☐ D. $10 to $24.9 million
- ☐ E. $5 to $9.9 million
- ☐ F. $1 to $4.9 million
- ☐ G. $500,000 to $999,999
- ☐ H. $100,000 to $499,999
- ☐ I. Under $100,000
- ☐ J. None

5b For the product/service groups listed below, please indicate the annual dollar value of computing/networking/communications equipment and software/services, which YOU are currently or will be involved in purchasing. Consultants: Please include what you recommend for your clients as well as what you buy for your own business. *(Write letter in appropriate box)*

- A. $100 million or over
- B. $50 to $99.9 million
- C. $25 to $49.9 million
- D. $10 to $24.9 million
- E. $5 to $9.9 million
- F. $1 to $4.9 million
- G. $500,000 to $999,999
- H. $100,000 to $499,999
- I. Under $100,000
- J. None

Product/Service

- ☐ 01. Electronic Commerce/Internet Business
- ☐ 02. Internet/Intranet/Extranet
- ☐ 03. LAN Hardware/Software/Servers
- ☐ 04. WAN Equipment/Software/Servers
- ☐ 05. Multinational Computer Networks
- ☐ 06. Telecommunication Equipment/Service
- ☐ 07. PCs (desktop, notebook, handheld) Workstations, Servers
- ☐ 08. Large/Distributed Systems (mainframe/midrange/mini)
- ☐ 09. Peripherals
- ☐ 10. Software
- ☐ 11. Systems Integrators/Consultants

❻ What is the highest level for which you buy, specify, recommend, or approve the purchase of computer products or services? *(Check one only)*

- ☐ 01. More than one company
- ☐ 02. Entire enterprise (all locations)
- ☐ 03. Division (multiple or single)
- ☐ 04. Department (multiple or single)
- ☐ 05. Workgroup (multiple or single)
- ☐ 06. Myself
- ☐ 07. Not involved

❼ Please check below all the products and services that you help acquire, either through approval, planning, recommendation or specification. *(Check ALL that apply)*

Enterprise Software/Services

- ☐ 01. Application Service Providers (ASPs)
- ☐ 02. Enterprise Resource Planning (ERP) Suites
- ☐ 03. Knowledge Management (KM)
- ☐ 04. Customer Relationship Mgmt. (CRM)
- ☐ 05. Groupware/Messaging
- ☐ 06. Systems Management
- ☐ 07. Accounting/Financial
- ☐ 08. Data Mining/Statistical Analysis
- ☐ 09. Data Warehousing
- ☐ 10. Relational Database (RDBMS)
- ☐ 11. Manufacturing
- ☐ 12. Middleware
- ☐ 13. Application Development Software
- ☐ 14. Sales Automation/Mktg.
- ☐ 15. Document Management/Imaging
- ☐ 16. E-Commerce Solutions
- ☐ 17. Transaction Processing
- ☐ 18. Human Resources (HR)
- ☐ 19. Computer-Based Training (CBT)
- ☐ 20. E-mail/Directory Services
- ☐ 21. PC Applications/Suites

Peripherals

- ☐ 32. Printers
- ☐ 33. Removable High-Capacity Storage (i.e. Jaz, LS-120, Zip, etc.)
- ☐ 34. Optical Storage
- ☐ 35. RAID Storage
- ☐ 36. Tape Backup Systems
- ☐ 37. Monitors
- ☐ 38. Scanners
- ☐ 39. UPS
- ☐ 40. LCD Projection Devices

Networking Products and Technologies

- ☐ 51. Storage Networking (SAN/NAS/SRM)
- ☐ 52. Network Management Software
- ☐ 53. Network Security Software
- ☐ 54. Remote Access
- ☐ 55. Multinational Computer Networks
- ☐ 56. Switches, Routers, Hubs

Server/Hardware

- ☐ 67. Storage Networking Server
- ☐ 68. Application Server
- ☐ 69. Communications Server
- ☐ 70. Database Server
- ☐ 71. File Server
- ☐ 72. Groupware/E-mail Server
- ☐ 73. Internet/Web Server
- ☐ 74. Print Server
- ☐ 75. Remote Access Server

Internet Infrastructure

- ☐ 86. Web Authoring (HTML, VRML, XML, etc.) & Development
- ☐ 87. Browsers
- ☐ 88. Security/Firewall/Encryption Software
- ☐ 89. Internet Service Providers (ISPs)
- ☐ 90. Search Tools/Engines

None of the above (1 - 90) ☐ 99.

Additional questions to be answered on reverse side. ➲

ABOUT YOUR COMPANY

⑧ Which of the following best describes your organization's industry or function at this location? *(Check one only)*

Non-Computer Related Industries
- ☐ 01. Aerospace
- ☐ 02. Manufacturing & Process Industries (non-computer related)
- ☐ 03. Finance/Banking/Accounting
- ☐ 04. Insurance/Real Estate/Legal Services
- ☐ 05. Government: Federal (including Military)
- ☐ 06. Government: State or Local
- ☐ 07. Health/Medical/Dental Services
- ☐ 08. Retailer/Wholesaler/Distributor (non-computer related)
- ☐ 09. Transportation/Utilities
- ☐ 10. Publishing (Print/Electronic)
- ☐ 11. Communication Carriers (ISP, Telecomm, Data Comm, TV/Cable)
- ☐ 12. Construction/Architecture/Engineering
- ☐ 13. Data Processing Services
- ☐ 14. Education
- ☐ 15. Agriculture/Forestry/Fisheries
- ☐ 16. Mining/Oil/Gas
- ☐ 17. Travel/Hospitality/Recreation
- ☐ 18. Marketing/Advertising/Entertainment
- ☐ 19. Non-Profit/Trade Associations
- ☐ 20. Research/Development Lab
- ☐ 21. Business Services/Consultant (non-computer related)

Computer Related Industries
- ☐ 22. Mfg. of Computers, Communications, Peripheral Equipment or Software
- ☐ 23. Computer Related Retailer/Wholesaler/Distributor
- ☐ 24. VAR, VAD, Systems or Network Integrator
- ☐ 25. Computer/Network Consultant
- ☐ 99. Other______________________ please specify

⑨ What is the total number of employees? *(Check one only in each column)*

		A. In entire organization	B. At this location
01.	20,000 or more	☐	☐
02.	10,000 - 19,999	☐	☐
03.	5,000 - 9,999	☐	☐
04.	1,000 - 4,999	☐	☐
05.	500 - 999	☐	☐
06.	100 - 499	☐	☐
07.	50 - 99	☐	☐
08.	20 - 49	☐	☐
09.	1 - 19	☐	☐

⑩ What is your organization's total annual budget for information services, including computers and communications hardware, software, consulting and services?
Consultants: Please include the budget for your clients as well as that of your own business.
(Check one only)
- ☐ 01. $250 million or over
- ☐ 02. $100 to $249.9 million
- ☐ 03. $50 to $99.9 million
- ☐ 04. $10 to $49.9 million
- ☐ 05. $5 to $9.9 million
- ☐ 06. $3 to $4.9 million
- ☐ 07. $1 to $2.9 million
- ☐ 08. $500,000 to $999,999
- ☐ 09. $250,000 to $499,999
- ☐ 10. $100,000 to $249,999
- ☐ 11. Under $100,000
- ☐ 12. None

⑪ Please indicate the Operating Systems/Network Environments currently in use or planned for use at this entire location. *(Check ALL that apply)*

Client Operating Systems
- ☐ 01. Windows 2000
- ☐ 02. Windows 95/98
- ☐ 03. Windows NT
- ☐ 04. Windows CE
- ☐ 05. MS DOS (alone, not with Windows)
- ☐ 06. OS/2
- ☐ 07. Mac OS
- ☐ 08. Linux
- ☐ 09. UNIX (any version)
- ☐ 96. Other

None of the above ☐ 97.

Server/Host Operating Systems
- ☐ 20. Novell NetWare
- ☐ 21. Windows NT Server
- ☐ 22. Windows 2000 Server
- ☐ 23. Banyan VINES
- ☐ 24. Linux
- ☐ 25. UNIX (any version)
- ☐ 26. Mac OS
- ☐ 27. OS/400
- ☐ 28. VMS
- ☐ 29. MVS/VM
- ☐ 98. Other

None of the above ☐ 99.

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SUNOCO'S STEVE WYATT says contractors can usually fill jobs while a company retrains existing employees

KELLY CULPEPPER

constantly be retrained, regardless of where they come from," Messina says. "I believe that engineers coming in on H-1B visas are facing the same rate of change that American workers are with every passing minute."

Messina says she would prefer to have companies — not government — foot the bill for retraining. "But sometimes government has to lead. I'm in favor of government incentives such as tax credits to help companies plan long-term with retraining programs that place more emphasis on problem-solving and interdisciplinary skills."

Gloria Montano, director of the virtual development center at the Institute for Women and Technology in Palo Alto, Calif., acknowledges the need for technically qualified people but says that businesses need to be held accountable. "Perhaps for each H-1B a company hires, they might have to reinvest some amount in their own [training] resources," she says.

According to Grant Mydland, manager of government relations at industry association CompTIA, the role of government should be to "provide a snapshot of where we are and where do we need to be in five years, then help us form local partnerships to get there. I see local IT companies working with community colleges to get individuals trained in right skills," he says.

Mydland is also director of the Technology Workforce Coalition (TWC), an industry alliance pushing for IT training tax credits, temporary H-1B visas, curriculum changes in schools and teacher training incentives. The TWC scored a coup in April, when the state of Arizona signed the Technology Training Tax Credit into law. The law provides companies 100% tax credits of up to $1,500 per year per person toward the costs of IT training.

"We're hoping for similar bills in 10 states next year," says Mydland. ◗

Wexler is a freelance writer in Campbell, Calif.

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the U.S. foreign intelligence agency seems to have had a hand in designing other things such as commercial software, possibly to make it more susceptible to Echelon interception and decoding. Last September, a North Carolina security company analyzing the Windows NT 4 Service Pack 5 noticed developers had forgotten to strip out debugging notations, and next to two keys found the labels "KEY" and "NSAKEY." Though inclusion of an NSA key is supposed to make it easier for government workers to trade confidential documents, such a key could also allow software with built-in "back doors" to clip information, encrypt it and then forward it to the NSA for processing. A Microsoft official says the key is labeled "NSA key" because the NSA is the technical review authority for U.S. export controls, and the key ensures compliance with U.S. export laws. He says Microsoft hasn't shared this key with the NSA or any other company or agency.

Windows isn't the only potential Echelon hole in an enterprise. Various telephone digital private branch exchanges are purported to have back doors for intelligence eavesdropping. The Swedish newspaper *Svenska Dagbladet* reported in November 1997 that non-U.S. versions of Lotus Notes contained an NSA co-designed way to more easily analyze e-mail. Every time Notes sends a message, the report claimed, it broadcasts along with the encrypted message part of the key it used to make the message more secure. The partial key is encrypted using an NSA public key. When the NSA intercepts the e-mail, the newspaper reported, it can use its private key to unlock the key, which is a guide to how the e-mail itself was encrypted.

Any involvement between the NSA and software makers is rumored, at best (Lotus officials weren't available for comment). But through Echelon, and with a bit of software engineering, someone who wants to listen to a company's communications might be doing so. ◗

Three Ways Echelon Works

ECHELON, the massive communications intelligence network run by the U.S. government, intercepts global communications for processing and analysis in several ways:

1 Undersea cable crossing onto land

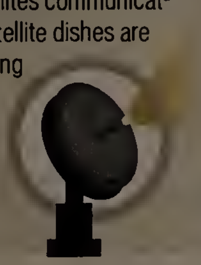
All copper cables emit electromagnetic radiation, making them easy to tap from a close distance. But National Security Agency researchers have had little success in tapping directly into fiber-optic cables, such as those forming the underwater backbone between the U.S. and Europe. Because fiber must be refreshed every 20 to 50 km, tapping into the refresh station is possible.

2 Satellite

A variety of intelligence satellites in orbit can detect signals otherwise impossible to efficiently monitor on Earth. All signals that normally dissipate into the Earth's curvature – for instance, many radio signals – are easy prey from space. Same with microwaves, which are often used for data transfer or as information backbones. The satellites can also record mobile phone conversations.

3 Satellite dish

At least six ground-based stations throughout the world are said to monitor Intelsat geosynchronous communication satellites. Signals from satellites communicating with their designated satellite dishes are imprecise. Echelon monitoring stations are often located within 100 km of the designated receiving station, close enough to receive the same signals.



ANTITRUST ACTIONS

In June, a federal judge ordered the breakup of Microsoft, saying the software giant abused its monopoly power. Microsoft is appealing the decision, and the case – brought by the Justice Department – is expected to reach the Supreme Court.

Last month, the Federal Trade Commission opened an investigation of potential antitrust issues into Covisint, the proposed new trade exchange being set up by the Big Three automakers. But Covisint's founders said they remain optimistic that the online marketplace will still launch according to schedule on Sept. 30.

The Senate Commerce Committee has planned a hearing into an online ticketing Web site being funded by the five largest U.S.-based airlines. The site, called Orbitz, is the first joint online venture between Fortune 500 competitors to receive this type of scrutiny from Washington. But Orbitz officials insist that the site will create, not stifle, open competition in the airline ticket marketplace.

In June, the Justice Department initiated an investigation to determine whether a business-to-business exchange being set up by six of the nation's largest meat producers violates antitrust laws. Ed Nicholson, a spokesman for Tyson Foods Inc., one of the site's developers, will cooperate with the government and is confident that the exchange will be allowed to go forward.

Electronic Government

DEFINITION

Electronic government refers to the automation of government-to-government and government-to-citizen interactions. Collaborative software and other tools are expected to help make transactions with government agencies, such as voting or renewing a driver's license online, faster and more efficient.

BY DAN VERTON

The web has forever changed the way governments at all levels interact with one another and with the citizens they serve. Widespread Internet access is expected to completely alter people's ability to tap into government resources in the next few years and make government work more effectively.

"The possibility of improving the performance of government and connecting government to citizens in a meaningful way using technology is enormous," says Pat McGinnis, president and CEO of the Council for Excellence in Government, a Washington-based nonprofit organization committed to helping improve the performance of government at all levels in the U.S.

Anyone, Anywhere, Anytime

"Electronic government is a situation where anyone anywhere can go online anytime, not only to get the information they need but also to actually receive services, complete transactions, communicate with their elected representatives and even to vote," says McGinnis.

PAT McGINNIS of the Council for Excellence in Government sees "enormous" potential in using IT to improve government

The transformation McGinnis describes is significant. Electronic, or Web-enabled, governments are quickly moving to offer citizens the opportunity to use their home computers to pay taxes, apply for student financial aid or renew drivers' licenses. It can mean the difference between standing in line at a department of motor vehicles office and going online in your own home.

Although electronic government has its roots in the future, it's not all vaporware today. Agencies, from the federal branches in Washington to the multitudes of state and local government offices around the country, are starting to push electronic government.

For example, most people can already file their tax returns online and take advantage of a host of other federal, state and local online services, which enable them to review real-estate records, apply for building permits or analyze legal records and regulations. And citizens appear to be willing to use these services.

Citizens Like It

A survey of 303 private citizens and 103 business representatives published last month by the Momentum Research Group at Cunningham Communication Inc. in Austin, Texas, found that two out of three adults have completed at least one government transaction online and that they're more satisfied with online services than they are with traditional forms of government interaction.

Several up-and-coming government Web sites were honored last month when MIT and Chicago-based Andersen Consulting presented their eCitizen Service Awards for best practices in electronic government (see box below). Judges selected government sites that are easy to navigate and support a plethora of transactions and services.

"At a minimum, e-government should be about enabling direct access to the relevant decision-makers or clerks with responsibility over your issues and transactions," says Daniel Greenwood, one of the four judges for the awards who is also director of the e-commerce architecture project at MIT.

Electronic government can help people reach out and get involved in the political process, says Greenwood. It can also help people be "digitally present at a legislative or administrative hearing," for example, while allowing them to oversee and guide government decision-making in the years between elections, he says.

Tackling Security and Privacy

The chief barriers to electronic-government "can be summed up in two words — security and privacy," says Joanne Connelly, a consultant at Federal Sources Inc., a federal contracting and electronic government consulting firm in McLean, Va.

"Funding constraints also are an issue. Convenience fees aren't going to work. Citizens won't pay," says Connelly.

There are also cultural obstacles within government that may limit acceptance of electronic government. "One barrier is the need for buy-in from all facets of government," including "every layer, from the secretary and deputies down to the lower-level employees," says Danielle Germain, e-government program manager at the Arlington, Va.-based Information Technology Association of America (ITAA).

Another critical issue for the federal government is its aging IT workforce, says Germain. Recent studies have shown that 60% to 70% of the 70,000 federal IT workers will become eligible for retirement by 2003. "This could severely impact the pace of e-government if steps are not taken to infuse new IT workers into federal jobs," she says.

Targeted training programs, better salaries and benefit incentives and more flexible hiring practices could help the government avoid a workforce crisis, says Marjorie Bynum, vice president for workforce development at ITAA. ◗

Verton is a freelance writer in Washington. Contact him at DMVerton@aol.com.

JUST THE FACTS

E-Government Online Resources

MIT's E-Citizen Program: *http://ecitizen.mit.edu*

Council for Excellence in Government: *www.excelgov.org/index.htm*

Momentum Group report, "Benchmarking the E-Government Revolution": *www.nicusa.com/NIC_flash/index_flash2.htm*

ITAA's Government Affairs Web Site: *www.itaa.org/govt/*

Federal Chief Information Officers Council: *http://cio.gov/*

FirstGov.gov: *www.FirstGov.gov*
A one-stop shop for locating government information on the Internet

For the People

Winners of the eCitizen Service Awards, sponsored by MIT and Andersen Consulting

■ **The city of Boston's Web site (*www.cityofboston.com*)** won in the local category, based in part on the volume of transactions it can support and the wide range of service areas people can take advantage of.

Services offered: Citizens can look up property information, access property tax information, add an event to the citywide calendar, request a voter registration form, get neighborhood information, find dog license information, look for a job posting and review restaurant health ratings.

■ **The Virginia Department of Motor Vehicles (DMV) (*www.dmv.state.va.us/dmvnet/online.asp*)** took the state-level award for best services by offering an electronic alternative to nearly every motor vehicle service a customer would receive if he chose to stand in line at an office.

Services offered: Ability to change an address, create a plate, order a souvenir plate, administer personal identification numbers, purchase an ID card, purchase a plate, renew a driver's license, renew vehicle registration, replace driver's license, request DMV record, request a hearing and take a sample knowledge exam.

■ **The U.S. Department of Housing and Urban Development's (HUD) Homes and Communities (*www.hud.gov*)** site won for best federal site. Judges credited the site's easy-to-use navigation tools and custom content designed specifically to make the site personally rewarding as elements in its success.

Services offered: Complaints/feedback, handbooks/forms, electronic reading room of manuals/documents, guides to owning a home and information about HUD and how to get help.

■ *Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.*

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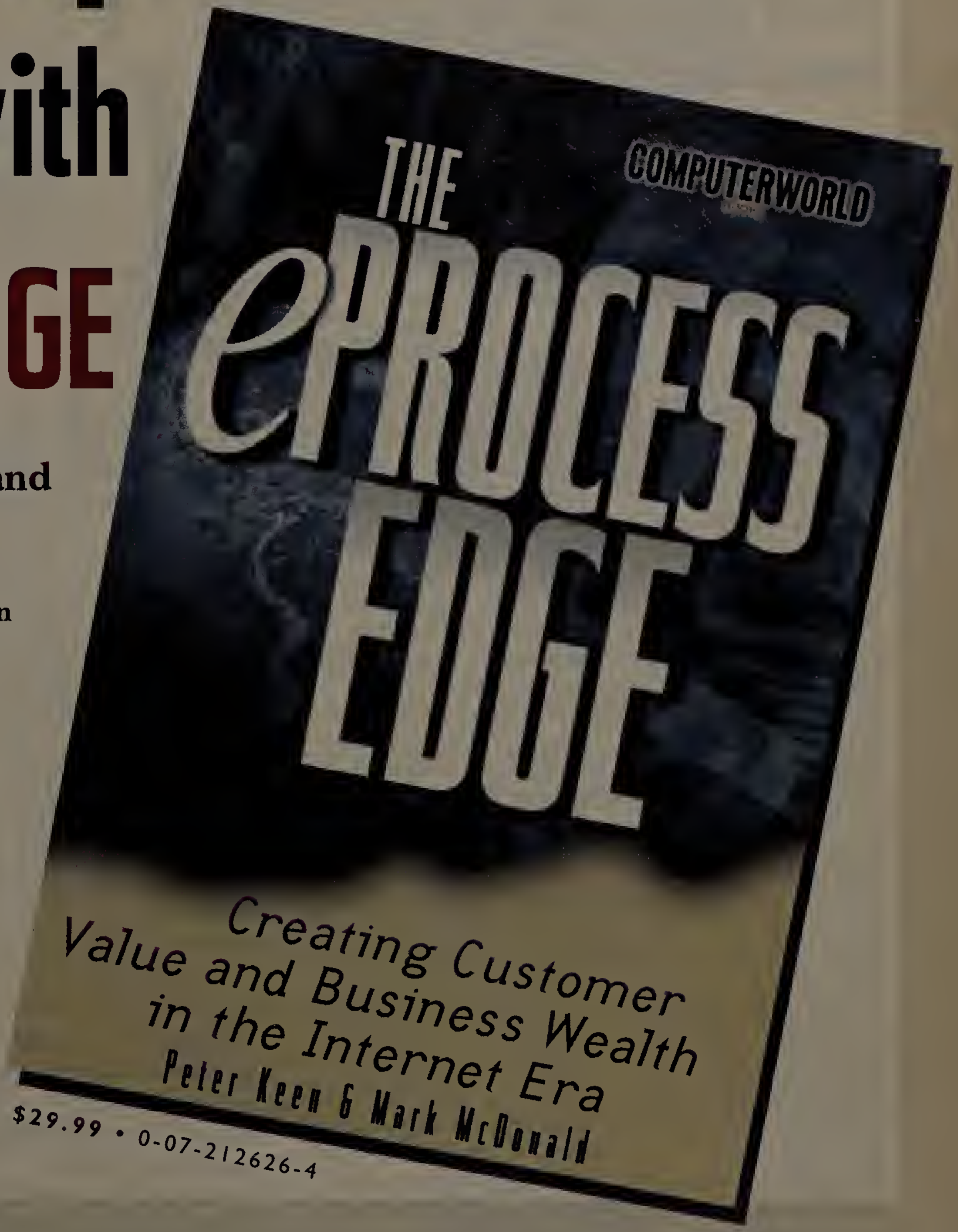

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Two thirds of all companies do not understand the gap between technology and process.

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>
> —Venkat Srinivasan, CEO,
> *eCredit.com*

***Peter Keen** advises leading-edge eCommerce companies. In addition, he has taught at Harvard, MIT, and Stanford Universities. In 1994, he was profiled by Forbes magazine as "the consultant from Paradise."*

***Mark McDonald** is an associate partner and director of Andersen Consulting's Center for Process Excellence.*

This book is part of the Computerworld Books for IT Leaders series. Available now at bookstores everywhere or call 1-800-262-4729.

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WORKSTYLES

What It's Like to Work at . . . Beenz.com Inc.

Interviewee: Neil Forrester, co-founder and vice president of development
Company: Beenz.com Inc., a global digital currency site. "That's officially. Unofficially, we're a thinly veiled cover for world domination."
Location: Based in New York, with headquarters for all technical staff and operations in London's West End. The company also has offices in San Francisco; Sydney, Australia; Paris; Stockholm; Singapore; and Japan.
Weren't you in the cast of MTV's *Real World London*? "That's unfortunately true. I was a rock 'n' roll man, but being a geek pays the bills better. I did the show in '95, and I was already doing Web scripting and design, but that didn't make it to TV. But now the Web is cool, so I was able to come out."
Number of information technology employees: 20, divided into three teams: developers, systems and security and enterprise applications (responsible for internal IT). "We started with just two geeks. I wrote the first version of the site in my bedroom."
Number of employees (end users): 263 as of the end of last month
IT hiring plans: "We may hire four to five more tech staff max by the end of the year."
Major IT projects: "We have an ongoing internationalization project, so now we're focusing on translating the system into Korean. The back end has to be able to handle Korean characters, which is tricky because they look funny and none of us speak Korean. We're using Unicode, an international standard for character representation, and then having it checked by the staff in Korea.

We're also building our WAP and iMode [Japanese wireless standard] versions for handheld devices, and we're doing some R&D into interactive digital TV. And we're launching some offline implementations of the product – ways to spend Beenz away from the computer."
Site traffic: Almost 1.9 million visitors hit the site last month, up 103% from 936,178 in June. "Our biggest base of users right now is in the U.S., but we have a very healthy European contingent. And Asia-Pacific is doing great."
Dress code: "Geek chic – anything but a tie. I make it a matter of course to employ freaks. Today, I'm wearing pink jeans, a black T-shirt and blue nail varnish. We have a long-haired hippie type who dresses up as a wood elf on the weekends."
Workday: From 10 to 11 a.m. to 7 p.m. to 4 a.m., "depending on their enthusiasm. By English standards, it's a fairly long day."
How do you deal with the time difference between your various offices? "If it's the U.S. calling, we're usually drunk by then. If it's one of the Asia-Pacific offices, we're usually asleep. We're big fans of e-mail and ICQ."
Decor: "An inflatable moose head on the wall, an Elvis clock with swinging legs, an interactive talking Yoda doll and an inflatable pink man that we got for a party. His head lights up."
Any interesting views from your office? "Well, the building opposite of us has two ladies of . . . 'professional status,' shall we say."
Compensation and bonuses: "The original developers got options, and we have an ad hoc bonus system that may be cash, options or toys."
What was the most unusual bonus? "It's not one we can publish."
A trip across the street? "No, unfortunately. We don't know their number to ring them up."
Favorite gossip topics: "The geeks are probably the least gossipy group in the office – we usually discuss Greek mythology or the latest Aphex Twin album."
Little perks: "We operate outside the law. . . . We go out for curry dinners and booze and a lot of other things I can't mention. A relaxed atmosphere – we're all friends outside the office. We're a motley crew."
How does working at Beenz.com compare with being in the cast of *The Real World*? "The pay is better."

– Leslie Goff
(lgoff@ix.netcom.com)

JIM CHAMPY

The 'New Economy'

THE PHRASE "NEW ECONOMY" doesn't have a hard-and-fast definition. You can decide for yourself what it means. When most people speak of the New Economy, they're usually referring to the Information Age, the Internet or something digital. The phrase also conjures up a vision of roller-coaster capital markets, speed, breathlessness and exuberant spending.

But some new business principles are emerging out of this melange of economic and technological change. Their practitioners declare them as ultimate truths, handed down to business mortals by some higher-powered e-gods.

Don't believe everything you hear. There are some new business principles that the so-called New Economy enables. Yet there are some old, almost counterintuitive principles that we shouldn't forget. Here are three examples.

New principle: Speed is of the essence.

Counterprinciple: You may have to slow down to speed up.

There's no doubt that the ubiquity of technology has contributed to the acceleration of almost all business processes. What's more, customers have become accustomed to *fast* — fast response, fast delivery, fast service.

There's also a developing business belief that, in the digital world, putting out a service or product first is critical to claiming a market, establishing a brand and raising capital.

But the digital world also confounds managers with critical questions that pop up like ducks in a shooting gallery: Should we be global, now that we can? How big should we grow, since the Internet removes some of the boundaries of scale? What's our optimal service and product scope? These are life-and-death questions.

We must all stop and think about the answers and not let the urgent issues force out the important ones.

> *Customers have become accustomed to fast.*

New principle: A company's most important assets are intangible.

Counterprinciple: The world still runs on bricks and mortar.

Proper value is now being placed on a company's knowledge, information and intellectual property. What you know about products, markets and customers may lead you to your ultimate differentiator. The Internet also allows you to trade in what you know, like selling advice or providing more information content with products.

But very few companies will survive by selling information or ideas alone. Most companies still make their money from selling tangible products. The future will belong to those companies that know how to make tangible and intangible assets work together for customers in unique and innovative ways.

New principle: If you take your company public, you'll have all the money to buy any capability that you haven't built.

Counterprinciple: Great companies grow organically over time.

Too much money can cloud your mind. For a couple of years, the capital markets were willing to provide lots of money to start-ups, many of which had little more than ideas. Although that phenomena has slowed down, there are still lots of venture dollars chasing ideas. The availability of money has made it appear a lot easier to buy parts of a company and put them together than it is to build a company from scratch. But putting a company together doesn't always work, as demonstrated by the poor performance of companies that have been assembled from parts of others — so-called "roll-ups." I believe that building a company organically develops a longer-lasting culture with a high sense of purpose and strong values. It's fine to grow a company through acquisitions, but all companies still need a set of core beliefs about things like customers, quality, innovation and respect for people. These elements must grow from within. You can't buy them.

The New Economy — however you define it — offers lots of opportunity and new ways for companies to operate. Experiment with them. Experience them. Debate them. But be prepared to find the real truths somewhere between the new and old ideas. ◗

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. He can be reached at JimChampy@ps.net.

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Books Offer Food for Thought On Management, Leadership

New titles to help career, business growth

Learning in Action: A Guide to Putting the Learning Organization to Work, *by David A. Garvin.* Explains how the organization can help you advance and perform better in the workplace. (Harvard Business School Press; 250 pages; $29.95)

Workplace Warrior: Insights and Advice for Winning on the Corporate Battlefield, *by Kay Hammer.* The story of one woman's struggle to reinvent her career and advice on how you can change the direction of your job. (Amacom Books; 230 pages; $24.95)

Emotional Value: Creating Strong Bonds with your Customers, *by Janelle Barlow and Dianna Maul.* Explains how you can improve business operations by making your company more customer-centric. (Berrett-Koehler; 300 pages; $27.95)

The Social Life of Information, *by John Seely Brown and Paul Duguid.* Explores the question: Will information technology advances destroy the social structure we know? (Harvard Business School Press; 300 pages; $29.95)

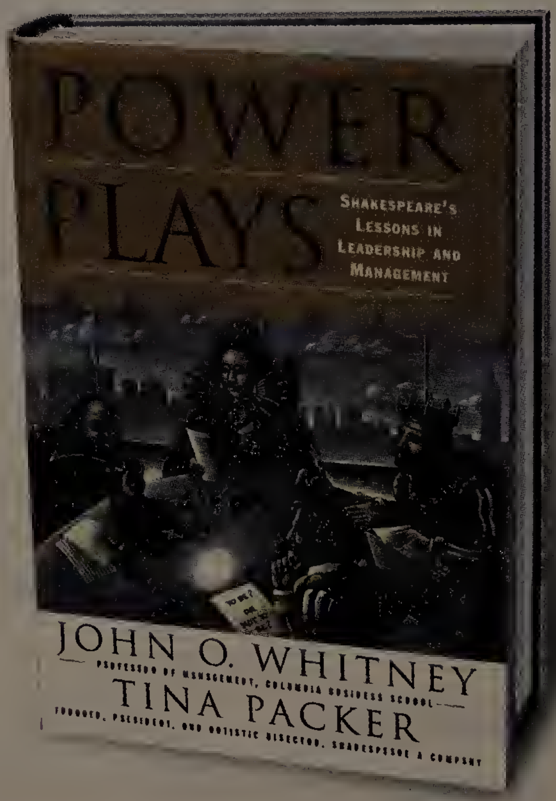
The Business of E-Commerce, *by Paul May.* Explains how business and technology decision-makers conduct business over the Web. (Cambridge University Press; 260 pages; $34.95)

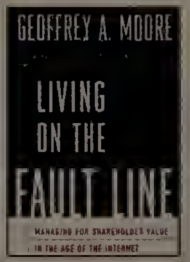
Unleashing the Killer App: Digital Strategies for Market Dominance, *by Larry Downes and Chunka Mui.* Explores how to exploit the New Economy and technology to your company's benefit. (Harvard Business School Press; 240 pages; $16.95)

Leading the Revolution, *by Gary Hamel.* Discusses how companies such as Amazon.com Inc., America Online Inc., The Home Depot Inc. and The Gap Inc. have revolutionized the business world. Provides insight into how your business can begin to compete in your market. (Harvard Business School Press; 352 pages; $29.95)

Power Plays: Shakespeare's Lessons in Leadership and Management, *by John O. Whitney and Tina Packer.* Explores how Shakespeare's works can teach you how to succeed in management and in your career. (Harvard Business School Press; 300 pages; $26)

The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail, *by Clayton M. Christensen.* Explains how the best business practices can lead to weaknesses in the New Economy. (Harvard Business School Press; 240 pages; $16)





Living on the Fault Line: Managing for Shareholder Value in the Age of the Internet, *by Geoffrey A. Moore.* A detailed account of business life on the fault line -- the delicate edge where the Internet and other technologies shape the market. (HarperBusiness; 280 pages; $27)

The Capitalist Philosophers, *by Andrea Gabor.* Tells the story of capitalism though the eyes of great thinkers who defined business. (Times Business Press; 320 pages; $38.95)

The Invisible Continent: Four Strategic Imperatives of the New Economy, *by Kenichi Ohmae.* Offers insight to businesses that want to succeed in the 21st century and provides information about the new global economy and its part in shaping business. (HarperBusiness; 230 pages; $27.50)

Enterprise E-Commerce, *by Peter Fingar, Harsha Kumar and Tarun Sharma.* Takes a holistic view of business and technology. Aimed at helping senior executives and project development teams move boldly into their e-commerce initiatives. (Meghan-Kiffer Press; 360 pages; $29.95)

Digital Capital: Harnessing the Power of Business Webs, *by Don Tapscott, David Ticoli and Alex Lowy.* Explores the business web phenomenon and the forces behind it. Features real-life stories about companies such as eBay Inc. and Cisco Systems Inc. (Harvard Business School Press; 250 pages; $27.50) (*Tapscott is a* Computerworld *columnist.*)

Building Wealth: The New Rules for Individuals, Companies and Nations in a Knowledge-Based Economy, *by Lester C. Thurow.* Explores how technology is changing the economy and the way people accumulate wealth. Discusses how you can succeed in the new global economy. (HarperBusiness; 288 pages; $14)

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Dear Career Adviser:

I've spent 25 years in information technology. During my first 10 years, I developed and maintained legacy systems. I've also managed programming teams that did the same thing. Now I want to transition myself into more modern skills and keep on working until I'm ready to retire. But I don't want to manage or compete head-to-head with younger technology gurus. Can I find a second career as a technical writer with newer companies?

— Want to Work

Dear Want:

Since senior technical writers working at software firms are often called upon to create their own code examples, your programming background could come in handy.

Nonetheless, your ability to succeed in making this switch will depend on your writing skills, plus your ability to handle a younger work and technology environment in a totally different capacity.

Start by attending a few meetings of your local chapter of the Arlington, Va.-based Society for Technical Communications (*www.stc-va.org*) to check out whether this transition will work for you, and check out *www.techpubs.com/resources.html.*

Also, obtain a copy of *The Elements of Style* by William Strunk Jr. and E. B. White, counsels Stan Sinasohn, senior technical writer at Hybrid Networks Inc., a broadband wireless company in San Jose.

You might take a couple of community college or evening courses. Additionally, learn Adobe FrameMaker inside and out; it's the standard software package for publishing technical documents.

The earning potential in this field can be considerable, says Sinasohn. Senior writers can earn $90,000 to $100,000 per year.

Dear Career Adviser:

For the past five years, I've been working half-time from a home office while building our house.

Now that I want to get back into work full-time, I can't — even though I'm an IT professional with more than 20 years' experience.

I spent the past 13 years as a computer consultant, and I have experience as a lead analyst in about 75 successful system development projects involving mainstream commercial programming languages, software and hardware, including Cobol, C, C++, DB2, Oracle, mainframes, PCs and the Internet.

I'm told I'm either over- or underqualified. Can I become employable again?

— Fatal Mistakes

Dear Fatal:

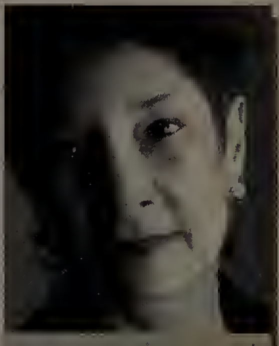
If you live in an area with a wide range of companies and can stomach a stab at full-time entrepreneurship, try building a full-time business for yourself.

This can be a lot more rewarding, says San Francisco based entrepreneur Jeff Marchi, founder of MIS Services. Your best possibilities will be in computer support or Web development work.

If you pick Web development work, target small companies that want to outsource their Web site development and maintenance. This will require the ability to program in HTML, XML and Java and handle some sophisticated Web site development tools.

If you select computer support as your business, Marchi counsels advertising in some of the free computer magazines found in many cities.

Concentrate on companies with fewer than 30 computers, since larger companies usually have their own internal support staff.



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at **www.computerworld.com/career_adviser.**

Dear Career Adviser:

I've been a software engineer for about five years and have a lot of good skills in Windows programming, HTML and Java. I have even done some work in C++. I'm keenly interested in exploring jobs in the wireless arena since it's becoming such a hot industry.

How can I get my foot in the door?

— Wireless Will

Dear Will:

Wireless is an explosive market growing exponentially as consumer demand drives development. "There are 100,000 developers writing for the Palm Pilot now, and they're growing at a rate of 2,000 a week," says Carl Yankowski, CEO of Palm Inc. in Santa Clara, Calif.

While there are lots of opportunities for people with Java and Windows skills, many other jobs in the wireless field require Linux, XML, and other languages and protocols specific to whether you are a hardware, software, systems, firmware or applications developer.

"We hire all of those kinds of people," says Carolyn Morris, CEO of Wireless Dynamics, a wireless modem company also in Santa Clara.

In short, if you're interested in writing applications for server synchronization, telephony, voice integration, hardware devices or specific applications — be they instant e-mail systems or services that offer financial or sports news or content geared toward a female audience — there's no shortage of opportunities. ▶

BRIEFS

Turnover Tolls

Employee turnover is costing the high-tech industry about $44 billion annually, according to research from management consulting firm Sibson & Co. in Lexington, Mass. The company, which pegs the turnover rate at 25%, based its estimate on the number of systems analysts, programmers and computer engineers who have left their jobs and on the amount of money employers have spent replacing them.

The New ASPs

The demand for application service providers (ASP) is rising, and the new growth area within the market is business process outsourcing, according to a report from Boston-based AMR Research Inc. Business process outsourcers handle the automation of specific business processes, allowing companies to eliminate whole departments and focus specifically on their core competencies.

Mixed Messages

A study on workplace messaging reveals that while U.S. workers get more messages than in the past, they feel less overwhelmed about it. According to the study by Pitney Bowes Inc. in Stamford, Conn., U.S. workers send and receive an average of 204 messages per day via voice mail, cell phone, e-mail, fax, pager, interoffice mail, postal mail and handwritten notes.

While the average respondent received more messages last year than in 1998, only 23% of the respondents reported feeling overwhelmed by their message volume, a 2% drop from last year and an 8% drop from 1998.

The Aging of IT

Companies need to prepare themselves for the retirement of key information technology professionals within the next decade, according to a report by Cutter Information Group, an Arlington, Mass.-based IT consultancy.

A recent Cutter report recommends that companies do the following to avoid a shortage of IT talent: Train existing staff rather than just hire new workers who already have skills needed in the company, monitor the average age of IT workers and train younger staff more aggressively while working to keep older IT professionals longer.

Partners Offer E-Commerce Lessons

Sprint Corp., Hewlett-Packard Co. and Boston-based *Inc.* magazine will partner to produce a series of seminars for small businesses on how to build an online presence. The four three-hour seminars are designed to address issues such as how to establish a virtual storefront on a budget and strategies to drive business to a Web store. For more information, call (800) 374-3734.

Rising IT Investments

Corporate investments in IT are on the rise, according to a global survey by A. T. Kearney Inc., a Chicago-based management consulting firm. Of the 251 CEOs surveyed worldwide, 78% said technology is extremely important to the future success of their companies, and 77% said their company's IT investment will increase over the next three years. One-third of the respondents said their IT investment would more than double by 2003.

Online Learning

The American Management Association (AMA) and Corpedia LLC recently announced that they will offer online courses for senior executives, managers and their teams, as well as the 220,000 corporate and individual members of AMA. The more than 100 courses will range from general management and sales to business etiquette.

TECHNOLOGY

GREEN-SCREEN DATA IN HAND

You might think there's nothing more traditional than a green-screen IBM AS/400 application. But some people are using conversion software to display AS/400 data on handhelds. ▸ **58**

SUPER SCHEMAS

New schemas, or database definitions, from the Distributed Management Task Force will lead to products that information technology managers can use to set and enforce service performance levels. The first products based on these schemas, though, aren't expected until early next year. ▸ **59**

HANDS ON

What? You don't have all the PCs in your home networked? Vendors will tell you it's quick and easy. But even a veteran computer user like reviews editor Russell Kay found that it's easier said than done. ▸ **62**

QUICKSTUDY

Most of the computers around you are invisible — not because of any magical properties but because they're hidden, or embedded, in other products. We examine what embedded microprocessors are and what they do. ▸ **65**

FUTURE WATCH

Developers at E Ink and Xerox are working on electronic replacements for ink and paper that may one day lead to electronic books that are portable, renewable and cheap. And imagine a grocery sign linked to an inventory system that automatically lowers the price on bananas when the store's inventory reaches a certain level. ▸ **67**

DIFFERENT APPROACH

Windows 2000 Datacenter Server will be different, not just for its design, but also for the way Microsoft is certifying and using third-party server vendors to distribute and support the platform. In an effort to make Datacenter more stable than its predecessors, Microsoft will sell the operating system only bundled with hardware from approved vendors. ▸ **70**

EMERGING COMPANIES

Cyclone Commerce in Scottsdale, Ariz., offers business-to-business supply-chain document exchange over the Internet. Its Java-enabled interoperability and quick installation could give IT managers a competitive jump on setting up trading communities. ▸ **72**

SECURITY JOURNAL

Determining that an employee has been surfing porn sites is one thing; proving who did it is another. Our security manager eventually turns to the tamer task of installing auditing and monitoring software. ▸ **66**

STAN BAROUH

EDWARD A. ROBACK says NIST's selection of a new standard encryption algorithm is being done with "an enormous amount of public comment and public analysis"

NEXT-GENERATION CRYPTOGRAPHY

IT'S ALMOST TIME TO SAY GOODBYE to that old security standby, the Data Encryption Standard (DES). The National Institute of Standards and Technology plans to select a replacement for DES by late summer or early fall. This week, we look at how the replacement for DES is being chosen and check out some of the leading contenders.

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Conversion Tools Bring AS/400 Apps to Handhelds

BY MATT HAMBLEN

To be a competitive executive in the advertising industry, Jeff Shaw needs to constantly review and edit graphical designs and advertising copy on the road.

The task becomes daunting when Shaw, principal at Boston-based Envision Marketing and Design Inc., wants to show the latest version of a new logo in a client's office, even though the artist finished the work only minutes earlier.

Previously, he might have relied on a fax, the client's desktop PC or his own laptop. But now he's trying to simplify the process by going wireless.

For a month, Shaw has been using a Palm VII handheld from Palm Inc. in Santa Clara, Calif., to connect over a wireless network to an IBM AS/400 server in his Boston office.

Less Clunky

"This process is great if you don't have access to a laptop," Shaw said. "And it means you don't even have to carry a laptop, which is clunky and heavy, and you usually have to plug it in to get anything done."

Conversion of the "green screen" AS/400 display to the Web and to the wireless format small enough for Shaw's Palm VII is accomplished with Results Quickly-Mobile Express (ResQ/ME) from ResQNet.com Inc. in New York.

ResQ/ME was announced in May and is available now; pricing starts at $25,000 for 25 users.

Other Choices

ResQ/ME isn't unique. IBM and Hummingbird Ltd. in Toronto offer products that deliver similar functions, and they actually use the ResQNet technology in those products, said analyst Darcy Fowkes at Aberdeen Group Inc. in Boston. Seagull Technology Inc. in Los Gatos, Calif., and Attachmate Corp. in Bellevue, Wash., also compete in the Web-to-host market, several analysts said.

ResQ/ME brings green-screen data to other handhelds and smart phones, including those based on Microsoft Corp.'s Pocket Pro operating system.

Analysts said they don't have estimates for the wireless portion of the market for software that Web-enables host data, but the overall market totaled $240 million last year, according to International Data Corp. (IDC) in Framingham, Mass. IDC said that number is expected to grow to $1.5 billion in 2004.

Indiana University in Bloomington plans to bring mainframe green screen registration data to Windows-type interfaces for up to 95,000 students in the fall, said Mike Floyd, manager of mainframe server administration.

Floyd is using ResQPortal because it allows the creation of Web-based pages in "hours or days, not weeks or months," he said. The university has purchased ResQ/ME for wireless use and may deploy it to give students the ability to check records — although not to perform actual transactions.

"Wireless registration might be cumbersome since device displays are so small," Floyd said. ◗

> This process is great if you don't have access to a laptop.
>
> JEFF SHAW, PRINCIPAL, ENVISION MARKETING AND DESIGN INC.

Just a reminder that there are a growing number of reasons to host your Web site on a Microsoft® Windows® 2000 server.

Since its recent release, Windows 2000 has already become more popular for U.S. e-commerce Web sites than Solaris 8, IBM AIX, MacOS, IBM AS/400 OS, Digital UNIX, and HP-UX.

—data from Netcraft, June 2000
U.S. E-commerce Survey

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BRIEFS

Amdahl Launches Storage Products

Amdahl Corp. in Sunnyvale, Calif., has rolled out the GSS 4900 modular storage system for data warehousing and media-streaming applications. The GSS 4900 offers up to four storage arrays, a 240,000-per-second I/O rate and 100M byte/sec. Fibre Channel ports. Pricing depends on configuration.

Compaq, RIM Team Up For Wireless Service

Research In Motion Ltd. (RIM) in Waterloo, Ontario, and Compaq Computer Corp. announced recently that they will co-brand a wireless e-mail service called iPAQ BlackBerry Wireless Email Solution. The service includes RIM BlackBerry handhelds, software and wireless services together with server hardware, enterprise messaging software and professional services from Compaq (see also page 32).

WebGain Integrates With StarBase

WebGain Inc. in Santa Clara, Calif., has announced that it will integrate its WebGain Studio application development tools with Santa Ana, Calif.-based StarBase Corp.'s StarTeam collaborative Web code and content change-management software. Company officials said that adding a collaborative infrastructure to WebGain's tools will make it easier for teams

New Management Standards May Ease Network Tuning

Schemas could help IT deliver the performance it promises to users

BY SAMI LAIS

The San Jose-based Distributed Management Task Force Inc. (DTMF) recently released new schemas, or database definitions, that lay the groundwork for information technology managers to specify and guarantee quality-of-service levels.

Products that follow the schemas will let IT managers set policies that enforce performance levels, including those established under service-level agreements. That previously hasn't been possible.

The Standards for Policy and Quality of Service (QOS) schemas are descriptive elements of the DTMF's Common Information Model (CIM) 2.4. A set of schemas for describing how systems and their components interact, CIM is a work in progress.

JUST THE FACTS

CIM 2.4

The new model should make life easier for IT managers.

- Adds schema for policy and quality of service
- Will let IT managers specify and guarantee levels of service for certain business processes
- Will offer network hardware support by year's end, applications support by next spring

Coming Next Year

Products that incorporate the new standards will probably be available next year, said David Kosiur, an analyst at Burton Group Inc. in Midvale, Utah.

But "as far as policy ... goes, no one has actually implemented" a policy-based network, Kosiur said. The breadth of the CIM standards helps ensure interoperability, but "it scares some people," Kosiur said. "They look at it [and] say, 'Do I have to implement all of this?' "

The answer is no, he said, as growing numbers of IT managers are finding.

CIM 2.4 systems will let network managers allocate network resources based on the business importance of the requesting transaction.

Revenue First

A manager could write a policy to ensure that if network traffic exceeds a certain level, users doing revenue-generating transactions would get precedence over those merely Web browsing, for example.

And that policy could further specify levels of action to be taken if response time for those transactions exceeded a desired limit.

Policy-based networks would handle such action automatically, which raises a trust issue among network managers, Kosiur said.

For policy-based networking to go anywhere, "we need ways to monitor what [the network] is doing," he said.

"CIM has an incredible amount of potential," Kosiur said. "I just hope that it doesn't die from the weight of its own potential."

CIM 2.4 supports the Differentiated Services Quality of Service model, according to Raymond Williams, vice president of technology at the DMTF.

In this model, smart devices act as traffic cops, monitoring a stream of traffic. Based on the QOS specification of each message, the devices aggregate and direct the messages into appropriate QOS streams.

Integrated Services (IntServ) "capabilities will be added in a future version," Williams said.

IntServ is based on the industry standard Reservation Protocol and relies on devices that act more as maître d's. For each message, the device sends a signal to the maître d' device receiving the message, requesting a level of QOS. The maître d' confirms the reservation and the sends the message. ◗

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of developers to collaborate on projects over the Web.

Toshiba Rolls Out Storage Array

Toshiba America Information Systems Inc.'s Computer Systems Division in Irvine, Calif., has announced the Magnia ESA4000 storage array. The Magnia ESA4000 features Fibre Channel host attachment and SCSI Channel device compatibility, scales from 90GB to 1.44 terabytes and includes RAID support.

CommVault Releases Software Suite

CommVault Systems Inc. in Oceanport, N.J., has announced the general availability of Galaxy Enterprise 2000 Release 2.5, a storage and data management software suite. It now supports Lotus Domino/Notes R5, Novell NetWare and Network Appliance Inc. filers.

XIOtech Introduces Storage Products

Eden Prairie, Minn.-based XIOtech Corp., a subsidiary of Seagate Technology Inc., has announced the Real-Time Data Intelligence (REDI) SAN Links and REDI SAN Links Replicator for XIOtech's Magnitude SAN hardware. REDI SAN Links enables various types of servers to access storage volumes on remote Magnitudes. A single Magnitude can now connect more than 500 terabytes of data storage. The REDI SAN Links Replicator copies individual storage volumes from local Magnitude boxes to remote Magnitude boxes, allowing for continuous backup of virtual disks.

Just a reminder the next time you're looking for a new, scalable, enterprise database solution.

Microsoft® SQL Server™ 2000 Enterprise Edition holds the J.D. Edwards® OneWorld® record with more than 3,400 concurrent users, surpassing the previous world record by 37%.

CONTENTS MAY STARTLE THOSE WITH LOWER EXPECTATIONS. USE CAUTION

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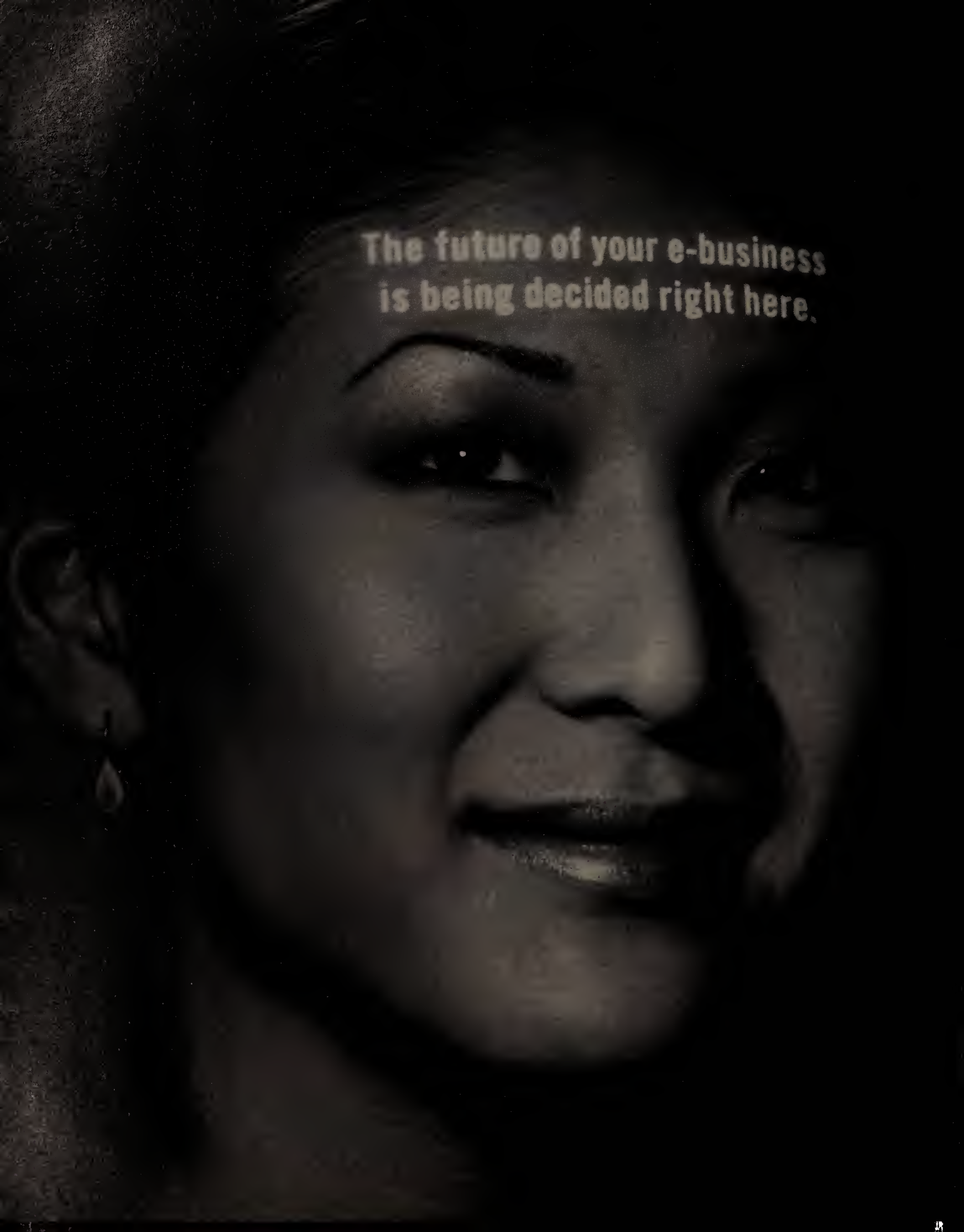
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Home PC 'Notwork'

A home network would be handy for a multicomputer family. Our reviews editor spends a weekend trying to set up a simple one – and admits defeat in Round 1. By Russell Kay

I'D BET MONEY that more than half *Computerworld*'s readers have more than one PC at home. Consider me — I have a computer, my wife has one, I bring a laptop home from work nights and weekends and I telecommute one or two days each week. So we have three computers, even without any kids. We recently got Digital Subscriber Line (DSL) service [Technology, July 10], and we both want to use it. Often, we want to exchange files, too.

There's only one good answer: building a home network. Coming to market is a rush of new equipment designed to simplify this process. If only it did.

I spent most of a weekend trying to set up a simple peer-to-peer, Windows-based wireless network at home that would connect three PCs and let them share a broadband Internet connection. I'm a reasonably experienced technician, with a good idea of what to do when something doesn't work, and I couldn't get it to run. It was a stark reminder of the arcana that underpin technology. An unsuspecting consumer or beginner, even one comfortable with computers, wouldn't have a prayer.

The Gory Details

I didn't want to pay an electrician to knock holes into my walls, and I didn't want network cables running up the stairs and down the hallway. I could build a network that runs over my existing phone line (which already carries the DSL service) or one that uses the electrical power lines as carriers. My first choice was a wireless home network.

At PCExpo, I saw a lot of new wireless network/Internet-sharing hardware. The first products to arrive for review were four devices from SOHOware Inc. in Santa Clara, Calif.: Broadband Internet Gateway ($199.99), which hooks up to the DSL modem for Internet sharing and includes firewall capabilities; the NetBlaster transmitter ($289.99), which looks like a CD player with horns; and two wireless network interface cards — a PCI card for the desktop and a PC card for the laptop ($189.99 each). I also had a DI-701 Residential Gateway ($99.99), a unit similar to the SOHOware gateway, from Irvine, Calif.-based D-Link Corp.

I hooked up the SOHOware components first, assuming that a single-vendor solution would go together more easily. I installed the supplied software, rebooting after every step. Right away, I hit a configuration problem — my wife's computer, a Hewlett-Packard Co. e-Vectra, has no slots into which I can install the wireless network interface card. The solution was to cable that computer directly to the gateway, so that part of the network can't be wireless but everything else can.

The network was in place; it didn't work. No computer could see another, and there was no Internet access. I substituted the D-Link gateway and installed its software. That didn't help. After rereading the manuals, I realized that my Verizon Communications DSL connection wasn't a direct connection to the Internet but instead used Point-to-Point Protocol over Ethernet. Thus, I couldn't hook up the DSL modem to either of the gateway units but had to connect it directly to the e-Vectra. So I reconfigured the system as follows:

- The DSL modem plugs into e-Vectra.
- The second network interface card connects the Universal Serial Bus port to external Ethernet hub.
- NetBlaster connects to the hub.

The modem, gateway and hub have their separate power bricks, of course, so I had to add a new power strip just to plug in the network hardware. (Tip: These power supplies are usually third-party, no-name makers and rarely reference even the brand of the equipment they go with. So every time I get a new power brick, I make an identifying label with a Brother International Corp. P-Touch or Dymo Corp. LetraTag label maker.)

After getting the DSL service hooked up to the e-Vectra and working, I plugged in the SOHOware components and installed their software for Internet sharing. I installed SOHOware's CableFree PC card into the laptop, rebooted and got a message saying it wasn't working properly. To eliminate one variable, I installed a standard interface card and connected it to the hub with a cable. Then, at last, I had a functioning network, though still no Internet sharing. It was Saturday night; I would finish up in the morning, I thought.

▼ DI-701 RESIDENTIAL GATEWAY from D-Link Corp. in Irvine, Calif. $99.99

On Sunday morning, I had no DSL connection. I clicked on the Connect button, and nothing happened. Eventually, I got an error message about a hardware problem. I unplugged and replugged everything and removed and reinstalled all the software, to no avail.

Then I disconnected everything and hauled it downstairs to my office. I plugged it all in, hooked up the modem to the phone jack . . . and without the network, DSL service was there. What happened?

Sunday afternoon, I took stock and realized I was trying to do three separate things at once: set up my computers and their various flavors of Windows as a home network, install the hardware for a wireless network and enable Internet connection sharing across the LAN. I need to start over, one function and connection at a time. And I need to talk with SOHOware's tech support. Stay tuned. ▶

▸ NETBLASTER from SOHOware Inc. in Santa Clara, Calif. $289.99

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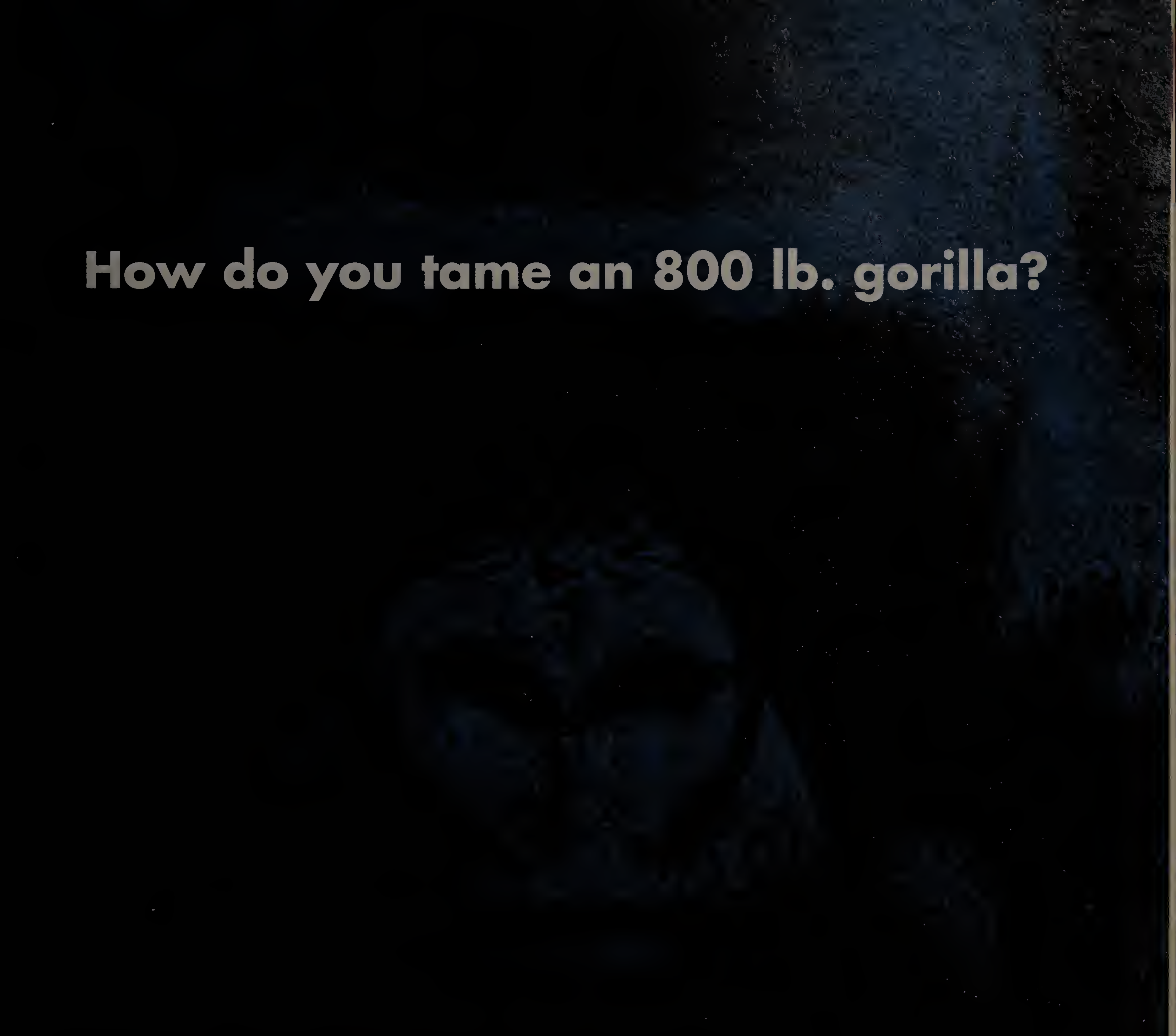
CableFREE



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Embedded Microprocessors

DEFINITION

Embedded microprocessors are computer chips used inside devices other than computers to provide added functionality, often in the areas of control and monitoring.

BY TOM R. HALFHILL

YOU CAN'T SEE THEM, but they're everywhere, exerting more and more influence on our lives, sometimes spelling the difference between life and death. We're talking about embedded microprocessors: the hidden chips that control everything from cell phones and microwave ovens to jumbo jets and antilock brakes.

Processors for PCs, workstations and servers get all the attention, but embedded microprocessors make the world go 'round.

Where the Sales Are

In terms of unit sales, PC processors like Intel Corp.'s Pentium series; Sunnyvale, Calif.-based Advanced Micro Devices Inc.'s Athlon; and IBM and Schaumburg, Ill.-based Motorola Inc.'s PowerPC account for only 6% of the world market, according to audited reports in the World Semiconductor Trade Statistics' blue book. The remaining 94% — 5 billion chips — consists of embedded microprocessors.

That startling statistic is more understandable when you realize how pervasive microprocessors have become. It's estimated that the average U.S. household has about 60 embedded microprocessors.

Some embedded microprocessors are hand-me-downs from the desktop market — chips that are obsolete for today's PCs but perfectly adequate for less-demanding tasks. The Z80 and 6502 processors that powered early PCs like the TRS-80, Apple II and Commodore 64 are still big sellers. In fact, 8-bit processors outsell the latest 32- and 64-bit processors by a 10-to-1 margin. Even the most feeble 4-bit processors far outsell 32-bit processors like the Pentium. Old microprocessors rarely die, and they hardly ever fade away — they just become embedded.

As a result, the embedded-microprocessor market is unusually broad. At any given moment in the PC market, microprocessors span a performance range of only about 3 to 1 — the fastest chips currently run at 1 GHz (1,000 MHz), while the slowest commonly available chips are about 333 MHz. In contrast, the performance range just for 32-bit embedded microprocessors is 500 to 1. If you factor in the 4- and 8-bit processors, the performance range is thousands to one.

Despite having thousands of off-the-shelf chips to choose from, many product designers need something unique. So they create their own embedded chips, called application-specific integrated circuits.

A designer starts by licensing an embedded-microprocessor core from a company such as U.K.-based ARM Holdings PLC or Mountain View, Calif.-based Mips Technologies Inc. and then adds features specific to his application. For a digital-camera processor, he might add a controller for the charge-coupled device chip; for an Internet-enabled appliance processor, he might add an Ethernet interface.

The designer takes the design to a foundry — a company that owns "fabs" (chip factories) and sells part of its manufacturing capacity to other companies. Popular fabs are United Microelectronics Corp. and TSMC in Taiwan and IBM Microelectronics in the U.S.

Customizable Processor Cores

Even that flexibility isn't enough for some designers. They can go to companies such as U.K.-based ARC Cores Ltd. and Santa Clara, Calif.-based Tensilica Inc., which license embedded-microprocessor cores that are highly customizable. With these cores, it's possible to create new machine-level instructions for special purposes.

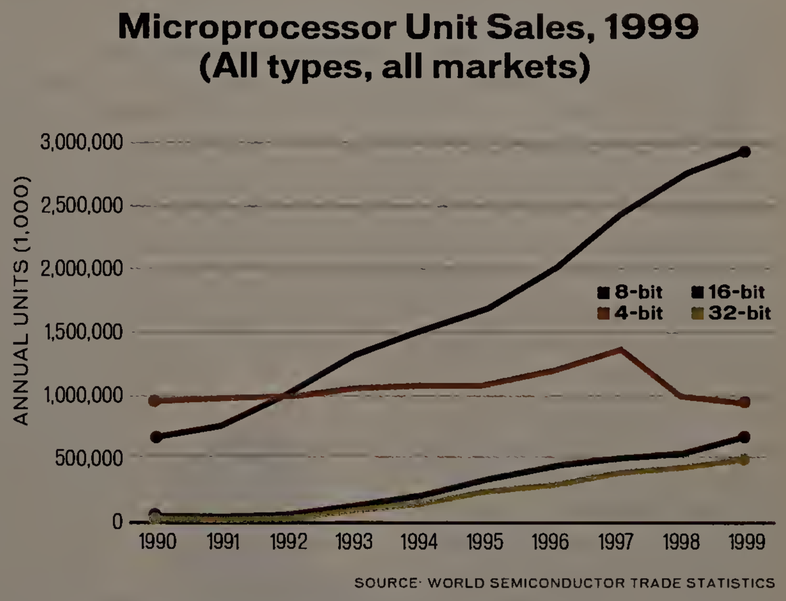
For a digital-camera processor, an instruction that speeds up JPEG image compression is valuable. For an MP3 music player, an instruction that accelerates audio decompression is equally useful. The customized designs then go to foundries for manufacturing.

Popular PC operating systems such as Windows, Mac OS and Linux are practically nonexistent in the embedded market, although Windows CE runs on some handheld computers and Linux is making inroads. Popular embedded operating systems are OS-9 (no relation to OS/2), pSOS, VelOSity, QNX, VxWorks and VRTX.

These are also called real-time operating systems, because they allow a processor to respond in a microsecond to critical events — such as a motorist stomping on a brake pedal. Despite the wide variety of such operating systems that are available, about half of all embedded-microprocessor designers write their own operating systems.

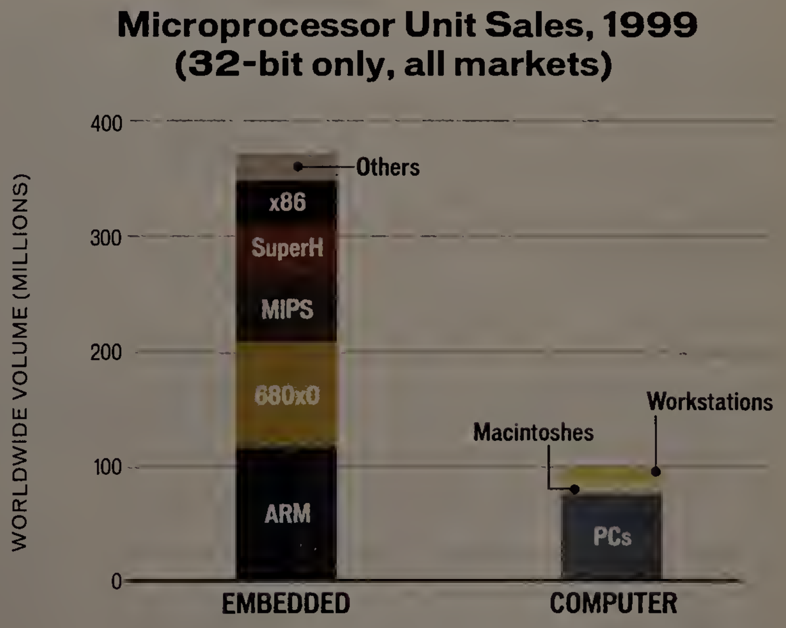
As these processors continue to become smaller, cheaper and more powerful, they will find their way into even more devices and products. Already, they're in singing greeting cards and in running shoes that measure your mileage. Eventually, they'll be almost as common as atoms — and almost as small, thanks to nanotechnology. ◗

Halfhill is technical editor at ARC Cores, which designs and licenses embedded-microprocessor cores.


Microprocessor Unit Sales, 1999 (All types, all markets)

SOURCE: WORLD SEMICONDUCTOR TRADE STATISTICS

Figure 1: Contrary to popular belief, 8-bit microprocessors didn't go out of style with disco and the Commodore 64. The 8-bit processors continue to outsell modern 32-bit processors by a wide margin, thanks to strong demand in the embedded market.


Microprocessor Unit Sales, 1999 (32-bit only, all markets)

SOURCES: VENDORS AND *MICROPROCESSOR REPORT*

Figure 2: Even the high-performance 32-bit market is dominated by embedded microprocessors, whose unit sales eclipsed the number of processors sold for PCs and workstations last year.

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Mystery Porn Surfer Becomes Phantom Menace

Determining that an employee has been surfing porn sites is one thing; proving it is another

Security Manager's Journal

IT'S BEEN A BUSY WEEK. I'm trying to keep track of the number of extremely senior people that I'm annoying, but it's not easy — and it's only going to get harder next week.

The trouble all stems from my innocent discovery last week that someone was surfing inappropriate (read: pornographic) Web sites from the workstation of an extremely senior member of the company. I promptly passed my findings over to human resources. A staffer approached the problem with guns blazing and then had to backpedal quickly when I reminded her that the data I'd passed her wasn't totally reliable.

The reasons behind that are complex. At the moment, users don't have to authenticate themselves to our Web proxy server. This means that our Web proxy has no idea who requests a particular Web page but only records the IP address from which the request came.

So I take the IP address, resolve that to a machine name using our domain name server (DNS) and then find out who's using that machine from our inventory system. It's not an elegant solution, but it leaves me about 95% certain of the identity of the surfer. That, as far as I'm concerned, is enough proof to warrant a quiet request to management to deal with the user.

Insufficient Evidence

Of course, this information isn't really enough to support disciplinary action. For one thing, we run Dynamic Host Configuration Protocol on some network segments. It dynamically allocates IP addresses, so the IP address reported in the logs may have been reassigned by the time I ran the scans and queried the DNS. It's also possible that our inventory system is incorrect, our cobbled-together log-scanning scripts have errors, my data manipulation in Excel introduced errors and so on.

Wednesday's tricky problem: While the great and the good are discussing exactly how to approach this issue from a management perspective, I find out that one of the "inappropriate Web surfers" is now using a different PC than he was last week. This must be due to a desk move. When I check his old PC, I find that it's now being used by a female summer student visiting from overseas.

Unless that Web surfer covered his tracks well — cleaning out his Web cache, deleting any download directories, wiping cookies and so on — he's bound to have left some trace of his former surfing activities on his PC. That means we may have a young female temporary employee from a famously litigious country using a company-issued PC that contains pornography.

One phone call later and the desktop support team finds an imaginary hardware failure on her machine; they swap it out for a new one without alarming anyone.

One way to confirm whether we have the right machine is to check for footprints in the system's history file. At the moment, I need to find a quick and easy way of remotely finding out what sites a particular user has visited. We use Netscape, but its history file isn't an easy format to read. I need a tool, so I turn to the Internet.

I find the Internet endlessly fascinating. It's not just the sheer amount of both useful and useless information that it holds, but also the untold stories that you can infer from the location and presentation of the information.

A search on Netscape's Web site for the file name netscape.hst gives page after page of links to sites in a wide variety of languages telling you how to find and delete this file.

The best of these sites, containing a good list of how to cover your surfing tracks (or what to look for if you're sleuthing), turns out to be on a Web page called Julia's Teen Crossdressing Page that's dedicated to helping teenagers hide their online activity from their parents. Eventually, I do find the utility I need — a program that pulls Web addresses from netscape.hst and turns them into a text list. It works perfectly. It's available at *www.rapca.org*, the Web site of the Regional Air Pollution Control Agency in Dayton, Ohio. What a bizarre pairing of Web pages.

I run the utility on the suspect machine's netscape.hst files. Yes, I have the right machine, but I still don't know who was using it at the time.

However, I've got this situation almost under control now. The scanning and much of the reporting is now done automatically, and all I have to do is report upwards. This should leave me a bit more time to concentrate on more normal work.

Time for an Audit

I'm looking forward to getting our auditing and monitoring software working. When I started working here, I was impressed to learn that we had a global enterprise license for what I think is the best software in this field, RealSecure security management software and the various SafeSuite scanner packages from Internet Security Systems Inc. (ISS) in Atlanta.

RealSecure acts almost like a burglar alarm. It has agent software sitting on key servers and key network segments constantly scanning all use of the system, in real time, for what it considers to be suspicious activity. When it finds evidence of a security breach in progress, it can take a range of actions, from alerting key personnel to automatically terminating user sessions.

ISS's Internet Scanner, System Scanner and Database Scanner act as technical audit packages. They find technical security vulnerabilities on target systems, report which vulnerabilities are present on which systems and what the associated risk is and then give detailed advice on how to fix the vulnerability.

I've heard a succession of good reports about these systems, seen numerous marketing presentations extolling their virtues and read many articles about them in the industry press. However, this is going to be the first time I've ever worked in a company that uses them in a production environment. Seeing that most of the rollout of the ISS system is already done, the budget's approved and we only need to arrange the training, things should be relatively simple. I can't wait.

And then, the last thing on a Friday afternoon, the guy who headed up the project to buy, implement and deploy the ISS software resigns. He leaves next Friday. Project documentation? Er … he's been meaning to get around to it for months now.

Why did I ever think things would be easy? ◗

THIS WEEK'S GLOSSARY

Domain name server: A service that runs on a host server and translates human-readable domain name addresses (*www.computerworld.com*) into IP addresses (208.184.36.144) that are machine-readable so the correct server can be found and the correct data returned to the requesting user.

Dynamic Host Configuration Protocol (DHCP): LANs using the TCP/IP network transport protocol generally have a finite range of IP addresses available. A DHCP-enabled server assigns and reallocates IP addresses to users as needed. The protocol allows more efficient use of those addresses because it can recycle addresses of users who log off or are inactive for a specified period of time.

Security scanners: These programs scan target systems for potential security holes. Software ranges from "auditware," which checks for deviations from a predefined standard configuration, to technical scanners, which probe for known bugs and security vulnerabilities.

Proxy server: An Internet server that controls client computers' access to the Internet. Using a proxy server, a firm can stop employees from accessing undesirable Web addresses, improve performance by storing Web pages locally and hide the internal network's identity so it's difficult for external users to monitor. Proxy logs can also show where users have been surfing on the Web.

LINKS:

***www.iss.net*:** ISS's home page includes descriptions of RealSecure security management tools and SafeSuite scanning packages.

***http://members.bianca.com/shacklet/juliateencd/anony.html*:** This document, "Covering Your Tracks," shows eight areas where Web surfers may leave evidence regarding where they have been browsing.

***www.rapca.org/closet.htm*:** This Web site contains Hstr.zip, a small DOS program that lets you extract Web addresses from netscape.hst into a text list.

***www.netscape.com*:** The first place to look for fixes for Netscape browsers.

This journal is written by a real security manager, whose name and employer have been disguised for obvious reasons. It's posted weekly at *www.computerworld.com* to help you and our security manager – let's call him Jude Thaddeus – better solve security problems. Contact Jude at jude.t@lycos.com, or click on Computerworld.com's Security Watch community forum to participate in discussion topics.

Roll Over, Gutenberg

Electronic ink and paper could revolutionize publishing and the way we read. By Meghan Holohan

IT WILL LOOK like any other digital sign. Every minute or so, the message will change. It might flash, "Bananas on sale," because it knows that there are too many bananas in the stockroom.

The sign will be made with electronic ink. It will be wirelessly connected through a two-way pager to the store's inventory database, allowing the sign to change its message according to stock demands.

As intriguing as signs like this may sound, they're just the beginning of what Cambridge, Mass.-based E Ink Corp. hopes to accomplish. The company is a leader in the development of electronic ink and "paper" that could replace newspapers and books as we know them today.

The use of electronic ink and two-way wireless communication could lead to the creation of electronic books that will renew themselves with new selections when readers are finished with the current book — or newspapers that update themselves with the latest news while being read.

> [Publishers generally] think they'll be working with ink and paper forever.
>
> SCOTT GRIFFITH, CEO, SOFTLOCK.COM INC.

Electronic ink, as devised by E Ink, is a clear, liquid plastic in which there are microcapsules that contain white chips in a blue dye. The microcapsules are suspended in a substance similar to vegetable cooking oil. The white chips are negatively charged so they react to electrical stimulus.

This ink can be spread on any surface — from walls to computer screens — says Russell Wilcox, vice president and general manager at E Ink. However, he says, the writing surface would look similar to a very thin laptop display screen with a clear surface on the front and circuitry on the back.

A positive charge applied on the top surface of the ink will allow the white to show, making the surface as white as a sheet of paper. If the charge moves to the bottom, the dark particles will show, giving the appearance of blue ink.

Electronic ink uses less power than a PalmPilot, Wilcox says, and the message remains displayed even after the power is turned off.

The ultimate goal is for the electronic pages to look and feel like paper. However, for the foreseeable future, these new books are likely to be bulkier than paperback books.

Wilcox says electronic ink will have interactive qualities, although E Ink isn't sure people will be able to write with it for a while — they will mainly receive messages. There should be demos for an electronic book with flexible pages within the next five years, he says.

Xerox Corp. is also working on a technology that could replace paper as portable, renewable reading matter.

The Xerox technology is called Gyricon. It's composed of a silicon rubber compound with the thickness and flexibility of poster board. The Gyricon sheets have thousands of plastic balls suspended in oil. Each ball is black on one side and white on the other and together they act as pixels to display images. Images can be updated much the same way as with a monitor.

The beads are embedded in a large sheet, with each microcapsule suspended in oil to allow the beads to rotate in their orbits, says Robert Sprague, manager of the document hardware lab and electronic paper projects at Xerox's Palo Alto Research Center.

Sprague says the paper could be powered by a matrix of transistors, such as those in laptop computer screens. Gyricon uses reflective light, like real paper, so it would use less electricity.

A Gyricon book will eventually be connected with a wireless device that will enable a reader to download content from the Internet.

Xerox will also make the Gyricon interactive, so a user could write on it and reuse it.

Users can download electronic books now from sites such as Maynard, Mass.-based SoftLock.com Inc., New York-based Barnesandnoble.com LLC and other book providers. While the technology exists for users to download a novel to their desktops, laptops or even specially made handheld devices, consumer and publisher interest in this area just doesn't exist, says Scott Griffith, CEO and president of SoftLock.com.

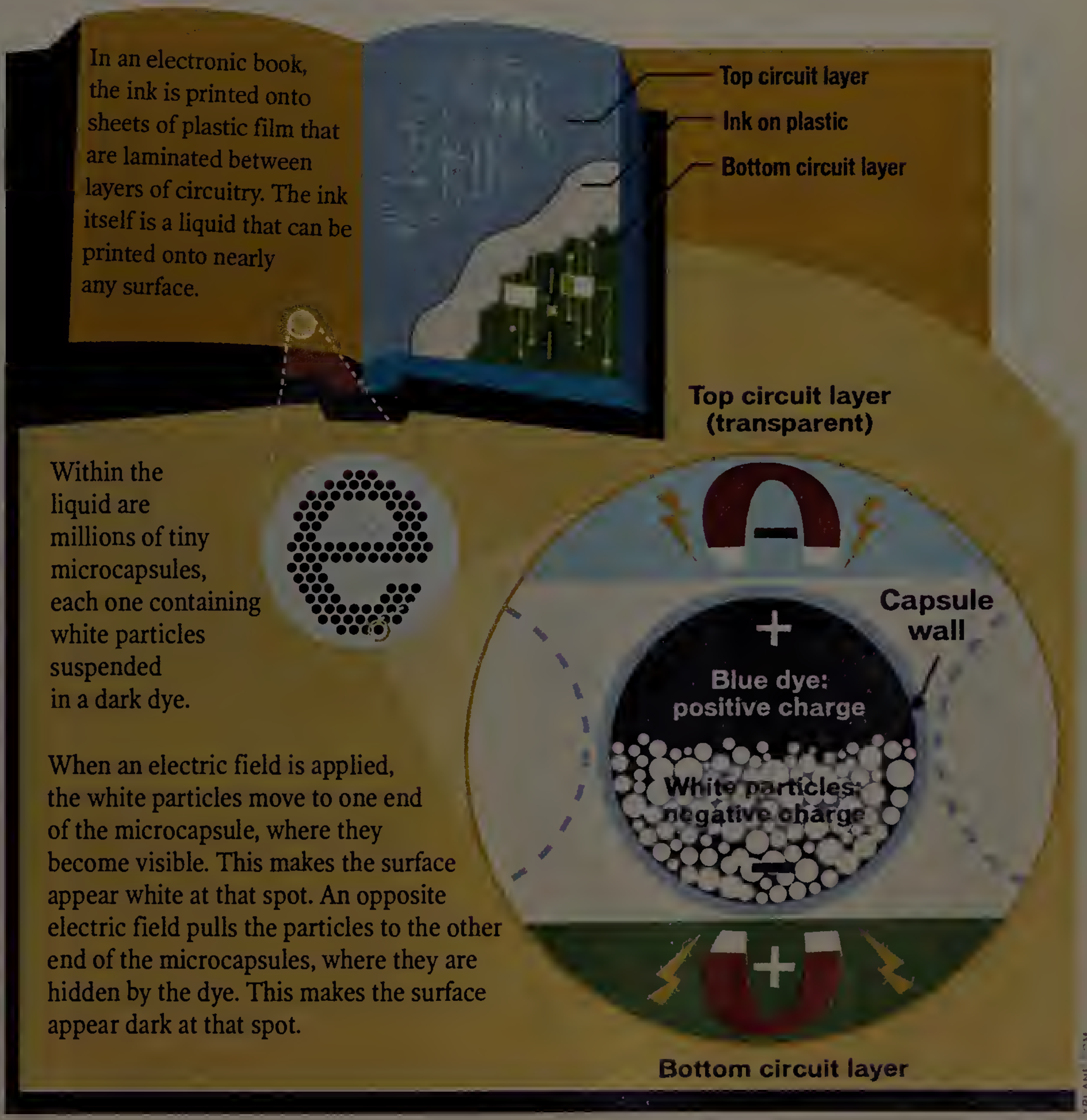
For electronic books to become mainstream, technology must be used to improve reader interfaces and downloading time, says Griffith.

Most people don't want to buy a device that downloads only books, or they don't want to download extensive text to read from a screen, he says.

"Publishers' general reaction to e-books is that they think they'll be working with ink and paper forever," Griffith says.

"How does the publishing industry make the e-book as big as the paperbacks?" he asks. "Paperbacks were not a substitution for hardback. It was a new product, a new market that needs a different price. We've yet to come up with that notion for e-books." ◗

How Electronic Books Will Work



In an electronic book, the ink is printed onto sheets of plastic film that are laminated between layers of circuitry. The ink itself is a liquid that can be printed onto nearly any surface.

Within the liquid are millions of tiny microcapsules, each one containing white particles suspended in a dark dye.

When an electric field is applied, the white particles move to one end of the microcapsule, where they become visible. This makes the surface appear white at that spot. An opposite electric field pulls the particles to the other end of the microcapsules, where they are hidden by the dye. This makes the surface appear dark at that spot.

Cryptographic Turning Points

This summer has been a pivotal moment in the crypto world: NIST is choosing a successor to DES, export rules have been eased, and electronic signatures have become legal for e-commerce. By Pete Loshin

IT'S TIME TO SAY GOODBYE to the Data Encryption Standard (DES). A replacement algorithm will be selected "late this summer or early this fall," says Ed Roback, acting head of computer security at the National Institute of Standards and Technology's (NIST) Computer Security Division in Gaithersburg Md.

DES, the standard for commercial encryption since 1977, is near the end of its useful life. In 1997, NIST announced its intention to develop a new algorithm, the Advanced Encryption Standard (AES), to replace DES and protect "the electronic data flow of the 21st century," according to Philip Bulman, NIST's spokesman.

Since its introduction, DES's adequacy has been re-evaluated every five years. A 1998 review concluded that the 56-bit-key DES was susceptible to brute-force attacks and should be replaced where possible with Triple DES, which uses 112- or 168-bit keys.

All five finalist algorithms — MARS, RC6, Rijndael, Serpent and Twofish — are officially still in the running, says Roback, and NIST has assembled a team to review all comments and prepare an analysis of the algorithms and the tests to explain how the winner is selected. "We're plodding through this process; there's an enormous amount of public comment and public analysis," Roback says.

Some experts say that the least likely of the five finalists to succeed are RC6 and MARS. One observer, speaking off the record, says that "RC6 and Mars are out of the running because they don't work in hardware." Carlisle Adams, a senior cryptographer at Entrust Technologies Inc. in Plano, Texas, says, "From the poll taken at the close of the final AES conference [in New York in April], it appears that Rijndael and Serpent are the front runners, with Twofish, RC6 and MARS, approximately in that order, following up."

Adams and others suggest that NIST may choose more than one algorithm. He says that two AES winners could be "given equal footing, or two winners with one recommended for some environments and the [second] recommended for others." Or, there could be one winner and one backup, in case the winning algorithm is broken or rendered unusable.

Adams led the team that submitted CAST 256, a candidate that didn't make the final cut. Bruce Schneier, chief technology officer and founder of Counterpane Internet Security Inc. in San Jose, leads the Twofish team. Both say they're happy with the way the selection is being conducted. Schneier says that "as a block-cipher cryptographer, this is the most fun I've had in my life." The selection process made it "much more real," he says. "I would do it again in a minute."

"The AES process has been as good as humanly possible," says Adams. Balancing conflicting objectives — such as allowing enough time for public comment without unduly delaying a DES replacement — isn't easy, he says, but "NIST has done everything in their power to make this process as open and fair as can be done" while avoiding the controversies that accompanied DES's selection two decades ago.

If DES is demonstrably weak, the encryption products that U.S. companies can export without limit is a joke. Commercial encryption items are controlled by federal export regulations. Those regulations have been significantly revised to mainly open up exports, but many non-U.S. consumers still face big hurdles in

ED ROBACK, acting head of computer security at NIST, says of the process of choosing a successor to DES: "We're plodding through this process; there's an enormous amount of public comment and public analysis"

STAN BAROUH

acquiring full-strength encryption tools. New regulations announced in January eased controls somewhat, allowing companies to export encryption products after a one-time review rather than requiring a new review for each sale. Last month, more restrictions were removed with an updated policy that allows U.S. companies to export any encryption product to any end user in the European Union and eight other friendly nations.

Dorothy Denning, a professor at Georgetown University in Washington, says encryption controls won't disappear. "There are likely to remain controls over exports to terrorist-designated countries," she says. But it isn't clear how far the feds will go. "I don't believe the government knows exactly where they will be on this in the long term," she adds.

How effective are the controls? Denning calls it a "hard question, for which I can't give you an easy answer." In a 1997 paper, "Encryption and Evolving Technologies as Tools of Organized Crime and Terrorism," she described how criminals were using encryption. She noted that although some criminals were using encryption programs such as Pretty Good Privacy, there was still value in maintaining controls. Although encryption is essential for legitimate users, Denning concluded that "because encryption can be exploited by criminals and terrorists, its completely unfettered proliferation may not be in our national interest."

Practical experience shows that encryption must be part of a wider security program. Denning reports that criminals using encryption are frequently thwarted by poor implementations, recovery of encryption keys and other weaknesses.

Schneier also points out the futility of expecting encryption to solve all security problems. "All the major security vulnerabilities have nothing to do with cryptography," he says. According to Schneier, cryptography can't protect against attacks such as the "I Love You" virus, distributed denial-of-service attacks, public-key infrastructure vulnerabilities or the Outlook bug. "When I look at a product, no matter how bad the crypto is, there's always something else that's worse," he says. ◗

Loshin (pete@Internet-Standard.com), a consultant, has written more than 20 books about the Internet.

Signing on the Electronic Line

It's finally as legal to sign a document electronically with the click of a mouse as it is with the ballpoint-pen click that's part of the process of writing your signature. President Clinton signed S.761, the Electronic Signatures in Global and National Commerce Act (also known as E-Sign), into law in June.

Public Law 106-229, as it's now known, puts electronic signatures on the same footing as ink signatures for affirming contracts. Many individuals and companies involved in Internet commerce say this legislation is a giant step forward. "The law rocks," says David Mirchin, vice president and general counsel at SilverPlatter Information Inc. in Norwood, Mass., and an adjunct professor of Internet law at Boston College Law School.

According to Mirchin, "an electronic signature under E-Sign is defined as information or data attached or logically associated with an electronic record and adopted by the person with the intent to sign the agreement." In other words, anything from clicking an "I agree" button on a Web page to sending a digitized thumbprint to using traditional digital signatures with a public-key infrastructure (PKI) can qualify.

Companies selling PKI products and services welcome E-Sign with open arms for its potential to boost e-commerce. Certicom Corp.'s Executive Vice President Richard Depew says the law is "certainly a step in the right direction," and that it also gives the go-ahead for the wireless transaction of business on the Internet.

The law doesn't identify a specific technology; it just puts electronic signatures on equal footing with ink on paper. This neutrality is widely viewed as a good thing. Bob Pratt, director of product marketing at VeriSign Inc. in Mountain View, Calif., says he's "pretty excited" about it because "it adds a framework for doing business online."

Although VeriSign's business is built on digital signatures, Pratt says he's happy with the technology-neutral law: "E-Sign legislation is not the last word – it's more of a beginning." According to Mirchin, "The key is not the technology but that the person must have the intent to be bound by the agreement."

A company proposing an electronic agreement should make it clear that clicking OK means that the parties involved have agreed to the terms. Entrust Technologies Inc. Chief Technology Officer Brian O'Higgins says digital signatures will become the prevailing form of electronic signatures, despite the law's technology neutrality and that other electronic laws will eventually be passed to "fill the gaps and get more specific about digital signatures."

Scott Schnell, senior vice president of marketing at RSA Security Inc., says he's also satisfied with the law's neutrality: "It establishes a universal baseline that is national" but also "creates a level playing field for the best technology to rise to the top."

Not everyone is a cheerleader, despite the new law's widespread support. Martin Reynolds, an analyst at Stamford, Conn.-based Gartner Group Inc., says there's a downside: "Our society does not understand security very well; a digital signature can be forged from anywhere on the Internet."

Bruce Schneier, founder of Counterpane Internet Security Inc., is more blunt. "I think they will be used in applications where they make no sense. And I think there will be a lot of fraud related to their misuse," he says. Schneier adds there will be "some high-profile disasters" and that the law will have to be fixed. "If you have Back Orifice on your computer, it could sign things on your behalf," he says. "There's a big difference between the signer computing the algorithm and the signer's computer doing the calculation." Schneier points out that we can know only that the signer's computer generated a signature, because "we have no idea whether the signer wanted the computer to do that."

At the same time, Schneier says that despite the availability of protective technologies, social constraints are far more effective at keeping people from killing each other. And despite the potential for fraud, he says, most signatures, both electronic and ink, will continue to be honored. – *Pete Loshin*

Win 2k i
Mainfra

Microsoft hopes to boost the stability of Win 2k Datacenter by selling it as a hardware, software and service package available only through certified hardware vendors. By Jaikumar Vijayan

When Microsoft Corp. rolls out its Windows 2000 Datacenter Server on Sept. 16, it won't be the technology alone that separates the operating system from previous versions of Windows.

It's also going to be the manner in which the product is packaged and delivered through qualified hardware partners that will boost its chances in the enterprise, users and analysts say.

Datacenter Server is Microsoft's most serious attempt yet to scale its technology into the glass house — a territory long controlled by mainframe and Unix vendors.

The operating system is being targeted mainly at high-end database, server-consolidation and application service provider markets.

Datacenter will support as many as 32 processors in symmetrical multiprocessing configurations and up to 64GB of memory. It will also include several availability and reliability features, such as four-node clustering, partitioning and dynamic load balancing.

Features such as these promise to bring new levels of reliability, availability and scalability to the Windows environment, says Bruss K. Bowman, founder of Quality Care Solutions Inc. (QCSI), a Datacenter beta tester and a provider of claims and benefits administration software for the health care industry.

"These attributes primarily allow us to have database servers capable of handling the largest health plans without having to split our database across multiple servers," adds Stephen Piazza, a senior software engineer at Phoenix-based QCSI.

Datacenter will offer QCSI "enterprise-class performance at both the database and business-process tiers," says Bowman.

Hardware Vendors Key

But a lot of its success will depend on Microsoft's hardware partners, who will preload, sell and support the operating system, say analysts.

In a significant break with tradition, customers won't be able to buy the software directly from stores or from Microsoft. Rather, they will only be able to purchase the application preloaded on qualified hardware sold by vendors that are part of Microsoft's Windows Datacenter Program.

Under the program, Microsoft and its server hardware partners will deliver Datacenter as a package of hardware, software and support services.

Only hardware vendors that have

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DATACENTER PROMISES new levels of reliability, according to Stephen Piazza (left) and Bruss K. Bowman of Quality Care Solutions

The Three Windows 2000 Server Operating Systems

Feature	WINDOWS 2000 SERVER	WINDOWS 2000 ADVANCED SERVER	WINDOWS 2000 DATACENTER SERVER
Processor limit	4	8	32
Memory support	4GB	8GB	64GB
Network load balancing	No	Yes (maximum 32 nodes)	Yes (maximum 32 nodes)
Server clustering	No	Yes (maximum 2 nodes)	Yes (maximum 4 nodes)
Job object	Job object API	Job object API	Process control tool
WinSock direct	No	No	Yes
Hardware compatibility list	Yes	Yes	Datacenter hardware compatibility list

tested their products under a Microsoft program will be certified to license and support Datacenter Server.

The goal is to improve reliability and application uptime, says Paul Sinton-Hewitt, a U.K.-based manager at Blue Bell, Pa.-based Unisys Corp.

"It's a process that is equivalent to the kind of testing that IBM does on its mainframes," says Sinton-Hewitt. The idea is "to stress-test for a period of 14 days any element of the configuration that touches the kernel of the operating system."

As a result, Windows 2000 Datacenter Server "is not [about] Microsoft's technology per se . . . it is the unique packaging," says John Enck, an analyst at Gartner Group Inc. in Stamford, Conn.

"There has been a lot of really intense work to test out Datacenter [on specific hardware configurations]," Enck adds. "We think that's a good thing for users."

Primary Contacts

Microsoft so far has certified only about a dozen hardware vendors, including IBM, Hewlett-Packard Co., Compaq Computer Corp., Dell Computer Corp. and Unisys, to package and sell Datacenter Server configurations.

The hardware vendors will be primary contacts for all Datacenter support issues. Most of them are setting up support teams combining their staff with Microsoft's support staff.

Compaq, for instance, has set up a permanent support facility at Microsoft's headquarters in Redmond, Wash., says Datacenter product manager Tim Golden.

"This is the second line of support for any Datacenter customer. They will be on the phone directly with engineers intimately involved" with Datacenter, he claims.

This kind of support is crucial, says Scott Newton, a senior technical architect at cookie maker Otis Spunkmeyer Inc. in San Leandro, Calif. "You are talking about a really heavy-hitting operating system here. You are talking about major changes and the need for a lot of expertise," he says.

"It's not something you are going to be able to peddle through Joe's Coffee Shop," says Newton, whose company recently deployed Microsoft's Windows 2000 across 63 of its offices.

Also, some of the reliability and stability woes that have dogged Windows for years have been the result of interoperability issues relating to third-party hardware and add-on software such as virus seekers.

For instance, "nearly 40% of all errors [in Windows NT] were coming from badly produced drivers from third-party device makers," claims Sinton-Hewitt.

Microsoft has been unable to do much because — unlike other major enterprise operating system vendors such as Sun Microsystems Inc., IBM or HP — it has had little control over the hardware on which its operating system runs.

The certification process is aimed at addressing that issue.

"The hardware qualifications Microsoft is using to create approved configurations will guarantee a rock-solid platform," says Piazza.

The basis for that stability, of course, will be some of the new technology in the core operating system itself, analysts say.

Here too, Microsoft appears to have taken steps to build in the features needed to tackle heavy duty application loads.

Key Capabilities

Users and analysts say Datacenter's key capabilities include the following:

►Symmetric multiprocessing support for up to 32 Intel processors. This provides for significantly more scalability than existing Windows versions, which top out at eight processors.

►Four-node fail-over capability for increased application availability. When a server in a cluster fails, the remaining servers automatically pick up the work of the failed servers. Previous Windows versions allowed users to link two servers in such a configuration. Four-node support will allow for greater reliability and better distribution of workloads.

►Support for up to 64GB of main memory. This will greatly boost the performance of applications that manipulate large amounts of data, such as databases and engineering applications. That's because increasing the amount of data that can be kept in memory makes for much faster processing.

►An application memory-tuning capability called 4GB tuning that basically boosts application performance by maximizing the amount of memory available to an application.

►A process-control tool for managing tasks such as allocation of system resources and fault isolation.

►An enhanced version of Microsoft's WinSock technology that boosts the speed at which applications will be able to communicate with one another in a network.

►Network load-balancing services to optimize network utilization.

Features such as these will make Datacenter especially suited as an application consolidation platform, says Tom Meile, director of infrastructure at Penn National Insurance in Harrisburg, Pa.

Penn National is in the process of consolidating applications from 60 servers to a Windows NT environment running on a 32-processor Intel server that it purchased from Unisys earlier this year.

Datacenter will allow Penn to eventually treat the server "more like a stable mainframe environment, where we will be able to run multiple jobs and balance the workload much better," says Meile.

Maybe so — but only eventually, caution analysts.

Don't expect Datacenter to immediately offer any significant price and performance benefits over the Unix and mainframe technologies that it will be competing against, says Al Gillen, an analyst at International Data Corp. in Framingham, Mass.

Features Already Available

Though the scalability and availability promised in Datacenter are new to Windows, they have been available for quite a while in the Unix and mainframe markets.

Take Sun's market-leading Solaris Unix operating system, for instance. The environment has supported 64 processors, dynamic partitioning and failure isolation for several years now.

Compaq's Tru64 Unix implements dynamic load balancing and TruCluster clustering technology for increasing application uptime. TruCluster software allows users to manager up to eight individual Web servers as a single system.

Although Microsoft is is still trying to make a case for users to consider Datacenter as an enterprise system, Unix vendors will be playing from rich experience, Gillen says.

"Unix vendors have a head start on Microsoft. That experience will translate into some sort of a core competitive advantage," when Datacenter server starts shipping, he adds.

The fact that Datacenter's implementations, at approximately $250,000, will likely have a much higher starting price than most Windows applications will also contribute to a cautious deployment strategy, predicts Enck.

"We expect fewer than 1,500 production servers to be running Windows 2000 Datacenter Server in the first 12 months after general availability," Enck says.

Meile says he doesn't foresee a quick migration to Datacenter despite its potential benefits.

Indeed, Penn National doesn't even plan to test it seriously until "maybe mid-2001 to late 2001," he says.

"We are going to have it," predicts Meile. "But we need time to spend on it. We need to play with it to make sure that we understand it fully." ◗

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Vendor Simplifies Document Exchanges

Cyclone Interchange translates, routes partner data over Internet

BY DAVID ESSEX

When Scottsdale, Ariz.-based Cyclone Commerce Inc. describes its business-to-business e-commerce niche, one gets a strong sense of déjà vu. The challenges of integrating business partners' network infrastructures and business processes sound identical to those of the enterprise application integration (EAI) world. For both, they boil down to bridging differences among systems.

That's exactly what Cyclone does with its flagship product, Cyclone Interchange, which launched in January. Interchange lets supply-chain partners securely exchange purchase orders, invoices and other documents over the Internet, avoiding expensive value-added networks (VAN).

Partners can exchange documents in incompatible formats such as XML and electronic data interchange (EDI). Interchange uses an open, Java-based architecture and has EAI-like connectors that handle translations.

Cyclone Commerce offers Interchange as a product and as a hosted service. The latter delivers "instant B2B infrastructure," says CEO Kent Petzold. "We have customers that deploy our product in under two hours," adds David Bennett, the company's founder and chief technology officer.

Cyclone's customers tout Interchange's ease of setup and quick return on investment. ExpressBill in Scottsdale, Ariz. (recently acquired by Atlanta-based health care giant Healtheon/WebMD Corp.), prints and mails statements for doctors' offices and hospitals that transmit insurance claims via EDI. The company offers Interchange to customers that are gearing up for new privacy and security requirements.

Mike Mayberry, director of systems and technology, uses Interchange to ensure that the proper file-level encryption and digital signatures are available to all members of customers' trading communities. ExpressBill installed Cyclone Interchange Enterprise Edition about six months ago and has one customer site so far.

Mayberry says he considered competitors, but Interchange seemed more comprehensive and scalable. He says he's impressed with the speed of installation and overall design. "I can install the thing myself," Mayberry says. "As an engineer, architecture is very important to me, and [Cyclone Commerce] spent a lot of time architecting this product."

SciQuest.com Inc., an electronic exchange for scientific supplies in Research Triangle Park, N.C., used Interchange to quickly connect some of its 700 suppliers and more than 80 enterprise customers. "We wanted something that would be easy for the buyer and seller to install," says Karen Hiser, director of e-commerce integration. It also wanted to improve the efficiency of order processing, much of it done via fax, EDI and XML.

In the Works

Hiser says she would like to see some improvements. She had problems getting Interchange to work with her IBM MQSeries middleware and wants clustering and failover support and document preprocessing. Cyclone says those features are in the works. But Interchange paid for itself early on in VAN savings alone, Hiser says, and SciQuest.com now offers it as part of its standard integration package.

Cyclone's prospects are bolstered by an impressive list of partners that use Interchange in their e-commerce offerings. The firm has a multimillion-dollar deal with Sterling Commerce Inc. in Dallas and GE Information Services Inc. (GEIS) in Gaithersburg, Md., which co-markets Interchange and uses Internet EDI technology from Cyclone Commerce in its GEIS Enterprise System messaging gateway.

Cyclone plans a new release this month. Interchange nTier will support Sun Microsystems Inc.'s Enterprise JavaBeans, include process-modeling and workflow tools and add finer control over software objects.

Although he won't reveal revenue, Petzold predicts that his company will be profitable within the next year and a half.

The company's biggest challenge, Petzold says, is to make itself heard amid the "market noise" of business-to-business e-commerce.

Customers "tend to gravitate toward the people who are getting mind share and the people who are promising to deliver, while we tend to deliver on promises," he says. "If we can get evaluated, we'll win." ◗

Essex is a freelance writer in Antrim, N.H.

DAN COOGAN

KENT PETZOLD (LEFT) and David Bennett say Cyclone can securely integrate incompatible business infrastructures

Cyclone Commerce Inc.

Location: 17767 N. Perimeter Drive, Scottsdale, Ariz. 85255

Telephone: (480) 627-1800

Web: *www.cyclonecommerce.com*

Niche: Business-to-business supply-chain document exchange over the Internet

Why it's worth watching: Its Java-enabled interoperability and quick installation could give information technology managers a competitive jump on setting up trading communities.

Company officers:
- Kent Petzold, CEO
- David Bennett, founder and chief technology officer

Milestones:
- 1996: Founded
- 1999: First product sold
- January 2000: Commerce Interchange released

Employees: 100; 125% quarterly growth rate

Burn money: Angel investors; $20 million round of venture financing under way

Products/pricing: Cyclone Interchange Enterprise Edition starts at $450,000; a version for trading partners costs $1,200 per year.

Services/pricing: CyclonePowered.Net outsourced network services; pricing varies

Customers: SciQuest.com, ExpressBill, Airborne Freight Corp., Anheuser-Busch Cos. and others

Partners: Sterling Commerce, GEIS, The ViaLink Co. and others

Red flag for IT: Competition looms from indirect competitors in the business-to-business market, whose offerings are more comprehensive, and from EIA vendors repositioning themselves for the business-to-business marketplace.

COMPUTERWORLD emerging companies

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B2B Competition

Cyclone Commerce wants a piece of the exploding business-to-business market. Its list of competitors includes vendors of marketplace-building tools that go beyond Cyclone's focus on migrating secure document exchange, from value-added EDI networks to the Web. Direct competitors include Artios Inc. in Omaha, CommerceQuest Inc. in Tampa, Fla., and IPNet Solutions Inc. in Newport Beach, Calif., says Ken Vollmer, a research director at Cambridge, Mass.-based Giga Information Group Inc.

"Cyclone Commerce will be successful in the long term because of the quality of their management and technical teams," Vollmer says. But its one advantage over these companies – its all-Java architecture – will likely provide only a fleeting advantage, Vollmer predicts.

Cyclone's real competition may come from traditional EDI companies like Software Technologies Corp. in Monrovia, Calif., that provide the business-process integration Cyclone Commerce lacks, according to Vollmer. It's also possible, but not likely, he says, that VANs like GE Global Exchange (a division of Cyclone partner GEIS) will find a way to lower costs, removing Cyclone's cost advantage.

IPlanet E-Commerce Solutions

Mountain View, Calif.
www.iplanet.com

IPlanet has a broader product line and deeper financial backing as the product of an alliance between Sun Microsystems and America Online Inc.'s Netscape Communications Corp. It sells Java-based application servers and has products for trading communities, including ECExpert, used by Bank of America Corp. and General Electric Corp. "We're an end-to-end e-commerce procurement solution," says Amy Millard, an iPlanet general manager.

WebMethods Inc.

Fairfax, Va.
www.webmethods.com

Proof of "co-opetition" among companies in Cyclone's industry, WebMethods sells products that interoperate with Interchange, says company co-founder and Vice President Charles Allen. WebMethods provides additional products for managing entire communities and for helping companies share business processes. WebMethods is about to release WebMethods for Trading Networks, which will compete directly with Cyclone Interchange. – *David Essex*

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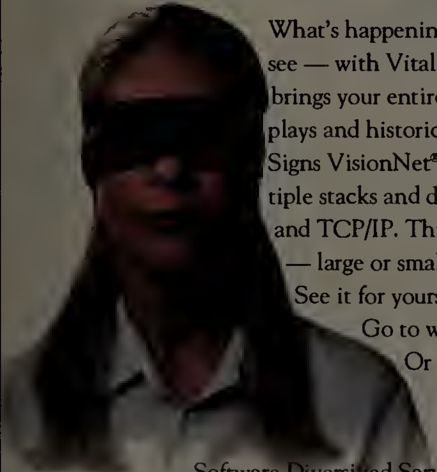

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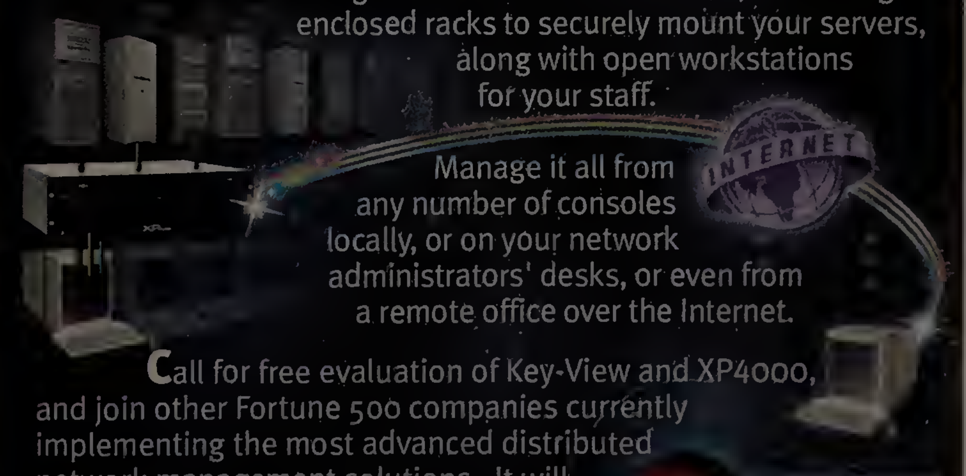

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RANDY HOLL, chief technology officer at Notara, says, "Generating synergy of thought in my development teams and across the whole company is the most exciting part of my job"

GREG KINCH

Builder of B2B

When a company embarks on a serious business-to-business application, the buck stops with the CTO. It's a role Randy Holl loves. But he offers some words of caution. By Bronwyn Fryer

> Learn as much as possible about your target market and how the people in it do their work.
>
> RANDY HOLL, CHIEF TECHNOLOGY OFFICER, NOTARA INC.

Name and title: Randy Holl, chief technology officer and vice president of development

Employer: Notara Inc., a New-York-based business-to-business company that enables secure, real-time collaboration among licensing and sponsorship partners.

Nature of his work: Holl is responsible for overseeing and implementing a secure, robust business-to-business infrastructure that lets Notara's customers share sensitive information over the Web.

Skills and experience: Holl was chief operating officer at Marine Management Systems, an enterprise resource planning systems firm in Stamford, Conn. In 1997, he built a distributed warfare system for the U.S. Navy. His work with client/server technology helps him "understand which steps in design and development are essential to product quality without sacrificing market responsiveness."

His impact: The technology is the company, and the buck stops at Holl. "My position is the equivalent of CIO, but with perhaps additional emphasis."

What he enjoys: The excitement of building new, Web-based technologies that solve a business-to-business need, and the opportunity to work with lots of smart people. "The energy is contagious."

Skills and experience required: Holl relies on his background in enterprise software and distributed systems development. Team management skills are particularly important, he says.

Salary, bonuses, perks: A $250,000 salary, plus stock options, benefits and bonuses. Notara maintains an office in Stratford, Conn., for just Holl and his team.

Toughest challenge: Staying focused. "You want to move quickly enough to fill the market demand, but not so fast that you lose sight of quality."

Greatest reward: The teamwork. "Generating synergy of thought in my development teams and across the whole company is the most exciting part of my job."

Future opportunities: Holl says he plans to stay at Notara and keep building large-scale business-to-business projects.

Advice: "Learn as much as possible about your target market and how the people in it do their work. Your company's reputation rests upon its performance, so don't sacrifice technology for a quick time to market. Quality is key." ◗

Fryer is a freelance writer in Santa Cruz, Calif.

Just the Facts

- **Name and job title:** Randy Holl, chief technology officer and vice president of development
- **Company:** Notara Inc., New York
- **Nature of his work:** Building a business-to-business Internet hub that includes a collaborative extranet software application
- **Why selected:** Because of his background
- **Training needed:** Deep experience in enterprise systems; team development skills
- **Salary potential:** Millions, if the company does well
- **Advice:** Stay focused on quality

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SR. SYSTEMS MANAGER (Software Engineer): 40 hrs./week, 8:00am to 5:00pm (M-F) for $64,105/yr.; Master's/Comp. Science or Mechanical or Industrial Engineering & 1 yr. exp. in job offered or 1 yr. related occuptn./Systems Analysis &/or Programming &/or S/W Engrn. &/or Computer Consulting. Work expr. in development s/w systems and with IBM M/F, DB2 and COBOL. Carry out the analysis, design and development of software application systems including project management, for manufacturing and industrial systems in an IBM mainframe environment utilizing DB2, CICS and COBOL. Will supervise 3 employees. Send Resume to Department of Labor, Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, Florida 32302. JOFL2106231.

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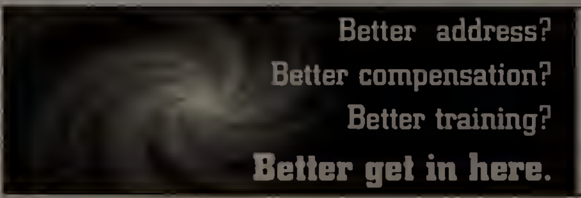

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SOFTWARE ENGINEER (position located in Atlanta, GA) to design, develop, analyze, debug and modify local, network or computer software programs for commercial or end user applications using C/C++; Perform testing and debugging of applications using Java/SQL; Maintain information of E-bills and customers using Oracle databases; Responsible for troubleshooting software applications and systems. Require: M.S. degree in Computer Science, Computer Information Systems, Engineering, or a closely related field; Must have a demonstrated ability to perform the stated duties gained through previous work experience or academic coursework and projects. Salary: $57,000 per year, 8 am to 5 pm, M-F. Send resume to KM-HR, CheckFree Corp., 6000 Perimeter Drive., Dublin, OH 43017; Careers@checkfree.com; Attn: Job MZ.

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LiveVault Corporation (formerly Network Integrity, Inc.) is looking for a Sr. Systems Software Engineer to be part of a team supporting our domestic and international customers. The candidate will configure and present our solutions to customers and enhance to provide additional functionality to meet client business needs. A candidate should have at least 5 years experience with Systems Software, Windows NT internals and have desire to travel to work closely with customers. A bachelor's degree or a master's degree in Computer Science or Engineering and Microsoft MCSE certification is required. Fluency in a European language is a significant plus. Location: Marlborough, MA. Working Conditions: M-F 8AM-5PM, 40hrs/wk. Salary: up to 90,000/yr. Send resume to: Attn: Rich Piccolo, LiveVault Corp., 201 Boston Post Road West, Marlborough, MA 01752. Ad paid by and equal opportunity employer.

Software Engineer-Voice & Data Telecoms wanted by Securities Brokerage Firm in Boston, MA. Must have 3 yrs exp dsng, dvlpg & implmtg nationwide voice & data telecommunication networks. Respond to: HR Dept, Brown & Co Securities Corp, One Beacon St, 18th Fl, Boston, MA 02108.

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SYSTEMS ANALYST
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Software Engineer (geocoding) in Lebanon, New Hampshire. Requires a Master's degree in Computer Science, Information Managment, Information Systems, or Computer Information Systems and five years' experience in the job offered or five years' experience in defining data structures, designing relational tables and writing applications to manage relational databases. One year of the stated experience must have involved the design and development of text and natural language processing tools. In lieu of a Master's degree, the company will accept a bachelor's degree and five additional years of progressive experience. Define data structures, design relational tables and write applications to manage relational databases. Design and develop text and natural language prcessing tools for geocoding systems, Maintain entire geocoding database for U.S. and European operations. Review and contribute to requirements, specifications and test plans. Design and implement specifications. Author design documents and provide well-documented code and process information. Identify and resolve issues to ensure quality product is delivered on time. Engage in continuous process improvment. 40 hrs./wk. 8:00 to 5:00. Salary $68,100 per year. Apply with resume to: Ms. Mary Gavin, Vicinity Corporation, 115 Etna Road, Lebanon, NH 03766

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PROJECTS CONSULTANT (multiple openings). Interact with client managers, IT personnel, integrators & users regarding functional aspects of each project, identify client businesses requirements & make decisions on specifications for configurations & implementation of software solutions,; create enhancement functional design specifications; provide change management guidance to clients, oversee testing strategies & analyze database code defects; establish client hardware & software environment, assist client with conversion determinations, troubleshoot & resolve data conversion issues. Requires prior use of 4 or more of the following: IBM, DEC, HP, SUN, Unix, Oracle, C, SOL, JavaScript, Visual Basic, Windows platforms, HTML, PL/SOL & TCP/IP.

SR. TECHNICAL ANALYST (multiple openings). Duties include change management, dev. testing strategies, analyzing database code to determine defects, creating technical design specs, troubleshooting & resolving conversion issues, project life cycle issues such as requirements, design, dev., installation, conversion training, & support; may prov. tech support to other depts such as sales & marketing re: to product design specs. Requires prior use of 4 or more of the following: Unix, SUN, IBM & HP platforms, C, Oracle, SOL, TCP/IP & PL/SOL.

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Director of Product Management (multiple positions): Coordinate & manage new telecommunications software product releases, analyze new industry technology & market trends, & support product marketing goals; review new product designs & specify requirements for application solutions; chair inter-department workshops & meetings, & coordinate creation of product release announcements; provide technical support to Sales & Projects Staff for increasing sales & improving customer satisfaction; coordinate promotion of new products through presentations at conferences, seminars, & road-shows throughout the U.S. &/or Latin America. Requires software development background. May require ability to read, write, & speak Spanish &/or Portuguese

Submit resume to HR Coordinator, LHS Communications Systems, Inc., 6 Concourse Pkwy., Suite 2700, Atlanta, GA 30328.

STAFF SOFTWARE ENGINEER (2 positions located in Atlanta, GA) to analyze, design, program, debug, & modify local, network, or internet-related computer programs for commercial or end user applications such as materials management, financial management, HRIS, or desktop applications products using DB2 database on IBM Mainframe hardware, QMF, COBOL, JSL, TSO, PL1, and Windows 95 development tools and MVS/ESA programming languages; Write code and program, test, & debug applications using current programming language & technologies; Write documents and procedures for installations & maintenance; Interface with users to define system requirements and/or necessary modifications. Require: B.S. degree or foreign equivalent in Computer Science, Engineering, Business Administration, or closely related field; Employer will also accept any combination of experience or education equivalent for a B.S. degree; In addition to the degree (or equivalent) job requires two (2) years of experience as a Programmer/Analyst,Consultant, Project Manager or Engineer; Experience must include two (2) years with DB2, MVS/ESA, COBOL and QMF. Salary: $65,000-$75,000 per year, 8 am to 5 pm, M-F. Send resume to KM-HR, CheckFree Corp., 6000 Perimeter Drive., Dublin, OH 43017; itcareers@checkfree.com

Software Engineer, North Carolina-Design, develop & implement software applications for wireless digital telecommunications switch networks. Develop & execute Object Centered Test & Verification Environment (OCTAVE) test interfaces for Asynchronous Transfer Mode (ATM) network testing. Analyze performance of ATM, Signalling System 7 & Internet Protocol data systems using traffic generation & network monitoring equipment. Determine software architecture req'mnts using object-oriented design methodologies. Design software using high-level programming languages in a UNIX & VxWorks real-time environment. Create ATM network interface & protocols. Document software req'mnts, incl. detailed design description & design test plan. 40 hrs/wk, M-F, 8am-5pm, $66,900/yr. Reqs. Master's in Comp. Sci or Engrng + 6 mos exp in job offered or 6 mos as Object-oriented engineer, instructor or researcher. Submit resume to: Job Service, 1105 Briggs Ave., Durham, NC 27703, or your nearest Job Service Office. Reference Job Order number NC3014053 & DOT code 030.062.010. All resumes must include applicant's social security number.

SOFTWARE ENGINEER: Analysis, design, development, testing and implementation of different applications using database such as Oracle, Access. Design of database, writing SOL and generating the back end code using Pro*C. Experience in developing GUI (Graphical User Interface) using Visual Basic, Oracle Developer 2000. Generating reports using Crystal Reports. The job duties are to Design, Develop, Database administration, Monitor database activities, Tune the database, Write Backup and Recovery procedures, Install and Upgrade the database, Test and implement the software. Requires High School in Sciences with 4 years of Software development experience. 40 hours per week at $ 50,000 per year. Please send resume to Case # 20002130, PO Box # 8968, Boston, MA 02114.

Senior Vice President, Director, Programs & Controls for large financial institution. Charlotte, NC: Direct the budget of approx. $200 million annually. Provide direction w/ respect to the dvlp. of strategic initiatives, coordinate the implementation of strategic tech. initiatives & evaluate tech. priorities & recommend new technologies to enure maximum production & optimum profitability. Requires BA/BS degree in Engineering & 5 yrs. exp. in the position offered or as Managing Director, CIO, Dir., or Mngr. The 5 yrs. of reqd exp must have been gained in the fin. mgnt. of an info tech dept. (at least 2 yrs of which included managing a budget in excess of $100 million), & must have included the management of larger scale cross functional information technology projects. 2 yrs. of the reqd exp must have been gained in the financial services industry including working with auditors & regulators. Send resume to Jane Higgins, FUNB, 1525 West W.T. Harris Blvd., Chlt., NC 28262-0775.

Senior Software Engineer and Software Engineer positions avail able to design, develop and implement software systems to determine feasibility of design and to direct software testing procedures, programming and documentation. Candidates must have one year of experience in job offered or as a computer professional. Some positions require additional year of experience in a particular skills set (see below). Bachelors or Masters degree, or foreign equivalent, is required in one of several limited fields: Computer Science/Apps, Engineering, Chemistry, Math, Physics, or scientific or business related field. In lieu of Masters degree, Bachelors degree, or foreign equivalent, with five years of progressive experience will be accepted. Work involves extensive travel and frequent relocation. Salary ranges from $70,000 to $120,000 per/yr depending on skill set and experience, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Rapidigm, Jaime Lopez, 4400 Campbells Run Road, Pittsburgh, PA 15205.

RDBMS: Informix, Oracle, FoxPro, Sybase, SOL Server, Progress;
Oracle RDBMS: Designer 2000, Developer 2000, Oracle RDBMS, SOL*Plus, Pro*C, PL/SQL, SOL*Forms, SQL*Reports, SOL*Loader, Oracle Forms, Oracle Reports, SOL*Menu, SOL*DBA, SOL*Net;
GUI: Windows 95/98/00, Windows NT, Visual C, Visual C++, C, C++, Visual Basic, PowerBuilder, MFC, Crystal Reports, COM/DCOM, CORBA;
Mainframe: IBM3090, IBM ES900, MVS, IMS, CL/400, CICS, TSO, VSAM, COBOL, JCL, AS/400, DB2, VAX/VMS, MVS;
ERP: PeopleSoft, SAP, Baan or Oracle Applications/Financials/Manufacturing/HR;
Internet Applications: ASP, HTML, Java Script, Java, Coldfusion, Broadvision, ATG Dynamo, Netdynamics, Websphere, Java Beans, Front page, CGI, Pearl, MTS, IIS;
CRM: Siebel, Clarify, Oracle CRM, SAP CRM;
DBA: Oracle, Sybase, Informix, SQL Server;
Unix/NT Administrators: Sun Solaris, IBM RS/6000, DG-Digital, SCO Unix, Windows NT Administrators, HP9000, HP UX, IBM AIX, IRIX.

Director-SAP Business Process Improvement: Hunt Valley, MD: Directing various module managers as the leader of the SAP Business Process Improvement Group, provide support to our SAP systems. Ensure transition of SAP systems by applying knowledge of SAP application in supply chain, manufacturing &/or finance. Manage SAP project work including software upgrades, bolt-ons, functional enhancements & integration of acquisitions. Implement systems to expand the functionality of SAP. Compile & present professional business case for significant enhancements to SAP environment. Direct the work of professional, technical staff & technical managers. Manage the SAP Center of Excellence. Bachelor's Degree or equivalent in Computer Science or Business Admin. & 5 yrs. experience in the job offered or in a related info. systems position OR 7 yrs. experience in the job offered or in a related info. systems position (i.e.: no degree). 5 yrs. experience must include at least 2 yrs. in info. technology project management & SAP application in a manufacturing organization. 40 hrs per wk. $80,000 per yr. Forward resume to Tom Costello, MIC, 200 International Circle, Suite 5000, Hunt Valley, MD 21030.

Software Engineer and Senior Software Engineer Positions to design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience in job offered or as a computer professional as well as one year of skills in field. Bachelors or Masters degree in one of several limited fields: Computer Science/Apps, Engineering, Chemistry, Math, Physics, or scientific or business related field. Will accept Bachelors degree with five of progressive experience. Salary: $65,000 to $105,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Rapidigm, Jaime Lopez, 4400 Campbells Run Road, Pittsburgh, PA 15205.

RDBMS: DB2, Informix, Oracle, FoxPro, MVS, Novell, UNIX, VAX/VMS, Windows, APT, Crystal Reports, C, C++, COBOL.
Oracle RDBMS: Designer 2000, Developer 2000, Oracle RDBMS, Oracle Applications, SQL*Plus, Pro*C, PL/SQL, SQL*Forms, SQL*Reports.
GUI and Internet Applications: Windows 95, Windows NT, Visual C, Visual C++, C, C++, Visual Basic, PowerBuilder, TCP/IP, HTML, MFC, CGI, MTS.
Mainframe: IBM3090, IBM ES900, MVS, IMS, CL/400, CICS, TSO, VSAM, COBOL, JCL, AS/400
PeopleSoft, SAP or Baan

Software Engineer wanted to develop software in client/server architecture for web-based communication and collaboration services; responsible for all stages of system development, incl. specs., design, coding, test plans & debugging; develop communication protocols bet. server & client over TCP/IP; use OOA/OOD methodology to design & implement server software under Linux, using GCC complier, BSDsocket, multithreading, Oracle, database connecting, & to design & develop Microsoft Windows-based client software using MFC/Visual C++ & WinSock, multi-threading; integrate third party's software components into client software; administer company's in-house system/network/intranet (Windows 98, Windows NT 4, Linux) & company's service server (Linux) operation network. Must have a Bachelor's degree in Computer Sci.' 1 yr. exper. in C++ development in client/server architecture incl. designing & implementing network communication protocol over TCP/IF & knowledge of OOA/OOD methodology. Salary $72,500/yr. Send two (2) resumes to Case #20002514, Labor Exchange Office, 19 Staniford Street, 1st Fl., Boston MA 02114.

SOFTWARE ENGINEER: Ability in using client/server architecture using ORACLE database and Java development tools like Visual /café 4.0 and Jbuilder3, Visual Basic, Windows NT, SQL Server and Rational Rose. Using version control tools like Visual Source Safe, and RCS. Ability in using Unix operating systems, Windows and software developing languages like Java, EJB, XML and e-Commerce tool INTERSHOP ENFINITY. The job duties are to Design, develop, client/server architecture applications, install and upgrade the applications, Write database procedures, work on enterprise level distributed applications with web technologies, test and implement the applications. Requires Bachelors in Computers or Sciences with 2 years of Software development experience. 40 hours per week at $ 50,000 per year. Please send resume to Case # 20002333, PO Box # 8968, Boston, MA 02114.

Caresoft, Inc. requires Computer Professional

Position available requires 2 yrs. exp. w/B/S degree for Programmer Analyst & 1 yr. w/ M/S. for Software Engg.

AS/400, RPG/400, COBOL/400
Visual Basic, Oracle, Crystal Report
Powerbuilder, Sybase, OLE
C++, Visual C++, Booch Rumbaugh Methodology, Oracle.
Java, Peoplesoft, HRMS, Benefits, SQR
Remuneration commensurate w/exp.
Travel & relocation required

Apply to
Attn: Recruiter
Caresoft, Inc.
3602 Hana Road
Edison, NJ 08817

AS/400 Systems Analyst/ Programmer

Develop, implement, & maintain programs on AS/400. Analyze and test programs written in RPG/400 on AS/400. Test, code, and debug new programs, modify existing programs using subfiles, RPG III, RPG IV, CL/400 on AS/400. Must have at least a BS or BE degree in Computer Science or related field and 1 yr. of exp. in the above position or 1 yr. exp. as an AS/400 Systems Analyst/ Programmer or a related position w/ability to program on AS/400 using RPG/400, CL/400, DDS, & Subfiles.

40.0 hr/wk. $59,774/Yr 8:00 AM -5:00 PM

Applicants send cover letter and resume to:

Paul Shaefer
Director of Human Resources
The Athelete's Foot Group, Inc.
1950 Vaughn Road
Kennesaw, GA 30144-7017

Tractor Supply Company is one of America's largest and most successful farm and ranch companies with over 298 stores. Due to our rapid growth, we need experienced computer professionals in our Nashville office.

Multiple openings. B.S. or equivalent required for all positions. Experience in retail industry preferred

Software Developers & Programmers: 2 yrs. experience in SAP/R3 Retail using ABAP, Oracle & SQL.

Database Designers & Database Administrators: 2 yrs. experience with Oracle.

Financial Systems Analysts: 2 yrs. experience in SAP/R3 Retail including FI/CO modules configuration.

Send resumes to Bo De, 320 Plus Park Blvd., Nashville, TN 37217. Email bde@tractorsupply.com

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SVI AMERICA CORP. is an information management & technology consultancy co. with offices throughout the US. We work with many organizations to develop integrated solutions that transform their enterprises. By understanding the key components that drive an organization, we are providing tangible results & a competitive advantage to our clients.

SVI America Corp. presently requires Programmer Analysts with the following qualifications: A Bachelor's degree in Comp. Sci., Math., Eng'g, Business Admin. or a related discipline, 1 yr exp. in job offered, and working knowledge of Powerbuilder, RDBMS, and SQL. Must be willing to temporarily relocate to client sites throughout the U.S.

To apply, please contact: HR Dept., SVI America Corp., 1580C John J. Delaney Drive, Suite 250, Charlotte, NC 28277 or E-mail: jobs@sviamerica.com.

SOFTWARE DEVELOPER III: Will be responsible for providing software engineering leadership in all phases of software development. Essential job functions include: develop, design and document software specifications; write, program, test and troubleshoot software programs and systems; and provide technical consultation, expertise and team leadership. Will also participate in defining and refining software Engineering Standards for the entire department. Requirements: Bachelor of Science or Art degree or equivalent work experience in CS, IT, Math, Statistics or a related field and six (6) years experience in the job offered or programming, software engineering, systems development or related field. Offered salary is $78,000/year for full-time employment (min. 40 hours per week) and standard company benefits. EEO. Submit 2 resumes and respond to Job Order # 2000-366, PO Box 989, Concord, NH 03302-0989.

SYSTEMS ANALYST
(Multiple Openings)

Analyze & evaluate existing or proposed sys. & revise computer programs, sys. & related procedures to process data using in-depth knowledge of software dvlpmt. life cycle. Encode, test, debug & install operating programs & other software systems. Design & code interface programs & client servers using BAAN ERP Manufacturing & BAAN ERP Distribution tools & programming languages. Bachelor's degree (or equivalent) in Comp. Sci., Math, Engrg., Business or Commerce plus 2 yrs. exp. in either job offered or as Programmer Analyst or Software Engr. rqd. Must be proficient in BAAN ERP configuration mgmt. & BAAN 4GL or PL/SQL programming language. High mobility preferred. 40 hrs/wk, 8 am – 5 pm, $88,000/yr. Qualified applicants report/submit resume to: Thomas Dembosky, Mgr., Indiana Job Ctr., 350 N. Fourth St., Indiana, PA 15701-2000. Refer to Job Order No. WEB115441.

SENIOR SOFTWARE ENGINEER: Design and development of distributed software and embedded agent development and VxWrks real time operation system within a SONET-based networking switch using ATM, Frame Relay IP and Ethernet protocols. Provisioning of circuits is done using signaling-related protocols such as TL1. Will use multi-tasking system and message-based system to implement standard-based TL1 agent that will manage the SONET switch. Requires: M.S. in Computer Science and 1 year Networking software development experience. Must have exp of CORBA, CMIP, Real Time OS Vx Wrks, C, WinNT, and SunOS. 40 hrs/wk (9:00 a.m. to 5:00 p.m.); $80,000/yr. Send two (2) resumes/letters of application to: Case # 20002332, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114.rahate-l

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IDOM Inc., a Banking Consultant Co. In Newark, NJ seeks people to fill the following positions:

I. Programmer Analyst (Multiple Opening)- Must have Bach. in Comp. Sci/ MIS or Math & 2 yrs exp in Power Builder Dvlp writing d/base prgms in SYBASE, MS-SQL server and ORACLE on multiple platforms incl. UNIX, Win NT/95.
II. Sales Manager - Expansion of sales and marketing operations of financial software to banks and investment houses: Development and implementation of sales programs / policies, Preparation of business plans to expand sales. Expand and develop new client base in banking industry. Bach. in Business Adm. and/or Marketing and/or Economics & 3 Years Exp. in job.

Respond to: HR Dept., IDOM Inc., One Gateway Center, 3rd Floor, Newark, New Jersey 07102.

[redacted]

Software Development Co. in Trevose, PA, seeks to fill the following positions:

i) Software Engineers (Multiple Openings) – Must have Masters in Math, Sci, Engg, Commerce or equiv & 2 yrs exp dsgng, dvlpg & testing in Sybase, Unix, C or SAP.

ii) Project Managers (Multiple Openings) - Must have Bach in Math, Sci, Engg, Commerce or equiv & 2 yrs exp dsgng, dvlpg & testing in Sybase, Unix, C or SAP.

Respond by resume to: HR Dept, Zen & Art of Client Server Computing, Inc, Neshaminy Interplex-US Rt 1 & Old Lincoln Hwy, Ste 301, Trevose, PA 19053.

SOFTWARE ENGINEER (2 Positions): Design, develop, test, implement, and maintain client/server and web-based applications for financial and banking industry using latest technologies. Requires: M.S. in Engineering field with NO EXPERIENCE or B.S. in Engineering field with 5 years of software development experience. Knowledge of PowerBuilder, ColdFusion, PL/SQL, ASP, COM/OLE, ActiveX, Developer 2000, Oracle, MS SQL Server, and Windows 95/98/NT. 40 hrs/wk (9:00 a.m. to 5:00 p.m.): $75,000/yr. Send four (4) resumes/letters of application to: Job Orders # 2000-342 and #2000-343, P.O. Box 989, Concord, NH 03302-0989.

Senior Software Consultant: Assist in the analysis development of enterprise architecture and Internet service architectures. Assist in the analysis and architecture solutions with enabling technologies such as XML, workflows and Internet service components. Requires: B.S. in C.S. or related field and 2 years experience in web-based applications development. Demonstrated knowledge of C++, Visual C++, SQL Server, and MS Access. Demonstrated skills with ActiveX, OLE, COM/DCO, and Object Oriented Design. 40 hrs/wk (9 to 5); $72,500/yr. Send two resumes/response to Case # 20001572, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114.

DTCC is seeking a Software Configuration Management Analyst. Will support Merant PVCS Version Manager and Tracker. Develop and implement version control standards and procedures for in-house developed applications. Create Change Management Process and recommend Change Management Best Practices. Integrate Web testing processes into application SCM Practices. Develop application practice standards/procedures for the Web envrmt. Hands on exp. in SCM. Prior knowledge of JAVA, HTML, XML, C/C++. Experience with MS Project or other task management tool. Business casual attire. Send resume to: recruiter2@dtc.org
www.dtcc.com

Programmer Analyst. $63K/yr. 8a-5p. 40 hrs/wk. Analyze, dsgn, dvlp & prgm systems & applics using C, C++, Borland C++, Visual C++, MFC, ODBC, DAO, SQL, VB, Visual Java++, Java, Sybase, UNIX & WinNT. Masters or equiv in Comp Sci, Electronics or related field of Engg. In lieu of Masters degree, candidate can have Bach deg in specified majors + 5 yrs exp as Programmer Analyst or Systems Analyst. Job loc: Duluth, GA. Send resume w/ref. file #2-018 to Softscape America, Inc, 3308 Peachtree Indus. Blvd, #120, Duluth, GA 30096.

Programmer Analyst wanted by Consulting Co in New York, NY for job loc throughout NYC metro region. Must have Bach in Comp Sci, Math or Engg & 2 yrs exp designing, developing, programming, installing & upgrading networked client/server & multi-tiered financial & business applications s/ware. Respond to: J. Ishikawa, Systems Research & Consulting, Inc., 276 Fifth Ave, Ste 802, New York, NY 10001.

Programmer Analyst wanted by Financial Information Services Co in Harrison, NY. Must have BSc in Comp Sci or related engg field. Respond to: HR Dept, Standard & Poor's ComStock, 600 Mamaroneck Ave, Harrison, NY 10528

Leading software and development firm seeking Consultants and Software Engineers with MS/BS. Perform systems requirements analysis and functional design, consideration and evaluation of alternative solutions and functional design. Perform system and component engineering and implementation, system and component testing, unit testing as well as integration of testing using engineering tools, SQL, and object databases. Send resume to: Maura Kohl, Recruiter, The Exeter Group Inc., 201 Broadway, Cambridge, MA 02139.

Programmer Analyst, Bedford, MA; Code, design, develop and analyze database applications using Web based technologies Visual Basic, SQL server, DHTML and Visual Foxpro. Provide technical support. Reqd. Bachelors in Computer Science or Engineering or Math. 6 months exp in job offered or 6 months exp in any computer related profession. 40 hrs/wk., 9a-6p. Mon-Fri, $56,000/Yr. Applicants should submit two (2) copies of resume in response to case # 20001997, Labor Exchange Office, 19 Staniford St. 1st Fl. Boston, MA 02114

Computer Programmer Analyst wanted by New Jersey based Software Development & Consulting & E-Commerce Co for job loc in NJ and elsewhere. Must have Bach in Comp Engg, Sci & 1 yr s/ware exp. Respond to: HR Dept, UCA Computer Systems, Inc., 9 Whippany Rd, Ste #12A, Whippany, NJ 07981.

SYSTEMS ANALYST, SENIOR (EAST SETAUKET, NY) Investment management firm seeks system analyst to design, develop, enhance & implement firm-wide back-up systems, maintain NIS+ data base & system programs utilizing UNIX, TCP/IP & PPP, & provide system level support. Successful applicants must possess Master's in Computer Science, at least 1 year exp. as Systems Analyst or Systems Administrator. Salary commensurate w/exp. Mail resume to: RTC, 600 Route 25A, East Setauket, NY 11733, attn: JR.

Software Installation Manager wanted by Co involved in s/ware solutions for the banking industry in Miami, FL. Must have Bach in Business Admin, Computer Info Systems & 2 yrs exp in banking comp systems mgmt. Respond to: Cluadia Suarez, Americas Software Corp, 550 Brickell Ave, Ste 503, Miami, FL 33131. Refer to code RES001.

Software Engineer wanted by S/ware Dvlpt & Consulting Firm in New York, NY. Must have Masters or equiv in Math, Comp Sci, Engg or equiv & 2 yrs exp dsgng & dvlpg integrated relational database applics using Oracle, SQL & MS Access & constructing GUI & web pages Java, HTML, VB, Oracle Forms, D2K & C. Respond to: HR Dept, Cyberstaff America, Ltd., 855 Avenue of the Americas, #618, New York, NY 10001.

Mgmt Consultant & S/ware Dvlpt Co in Warren, NJ seeks to fill the following positions:

1) OLAP Specialist - Must have BS or equiv in Comp Sci, Math or Engg & 3 yrs s/ware exp.

2) Software Developers - Must have BS or equiv in Comp Sci, Math or Engg & 3 yrs s/ware exp.

Respond to: HR Dept, Enable Vision, LLC, 50 Mount Bethel Dr, Warren, NJ 07059.

Software Engineer. $65K/yr. 8a-5p, 40 hrs/wk. Analyze, dsgn, dvlp, prgm, test & implmt systems & s/ware applics w/h/ware product dvlpmt using C, Visual C++, Visual J++, Power J, Java, Oracle, Sybase, Cloudscape, Neva, COM, UNIX and Win NT. Masters or equiv w/major field of study in Comp sci or Engg, Electronics, Electrical or related branch of Engg. Job loc: Charlotte, NC. Mail resume to: HR, Youcentric, Inc, 600 Fairview Rd, Ste 405, Charlotte, NC 28210, or email to: resumes@youcentric.com

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Software Engineer wanted by New Jersey based Telecom Consulting Firm for job loc throughout the US. Must have Masters in Comp Sci, Engg, Elec Engg & 2 yrs s/ware exp. Respond to: HR Dept, MJ Technology of NJ, Inc., 762 Green St, Ste 2C, Iselin, NJ 08830. (Ref. 59781M).

Programmer Analyst/SAP Consultants wanted by Software Dvlpt & Comp Consulting Services Firm in Edison, NJ. Must have Masters in MIS, Comp & Business or Engg & Business & 6 months comp exp. Respond to: HR Dept, Strategic Professional Services, Inc., 505 Thornall St, Ste 304, Edison, NJ 08837.

SW Eng'rs (4+ positions open): Research, dsgn, devl'p communic'n SW applic'n w/ DB2, CICS, VSAM, VC CobolII; dsgn bus. mgt sys. w/ PowerBuilder5.x, Oracle7.x SQL Server; Devl'p eng'g process & intranet/internet applic'n w/ Java, VC++ on WinNT4.0/Unix; Dsg GUI w/ VJ++, Symantec/Visual Café, SunJDK & C++ on MFC; Train clients at their sites. 40h/w, 8-5, $68,034/year, Bachelor/foreign equivalent in bus., eng'g, or computer related fields, & 5 yr exp. in any SW position w/ Oracle, DB2 & VC++; or Master dgr & 1 yr exp. Resume to Job Ord.#2000-335/6/7/8, PO Box 989, Concord, NH 03302

Software Engineer wanted by Software Dvlpt & Consultancy Firm in New York, NY. Must have Bach in Engg, Science, Commerce, Math or equiv & 3 yrs exp dvlpg, testing, documenting & planning comp prgms. Respond to: HR Dept, ConciseDesign, Inc., 350 5th Ave, Ste 1833, New York, NY 10013.

Programmer Analyst - Ann Arbor, MI - Analyze reqs, design, develop & implement database mgt sys using Object Oriented Analysis & Design. Use C/C++ language, Visual C++ & MFC on UNIX & Windows NT platforms. M-F, 9AM-5PM, 35 hrs/wk, $56,000/yr. Reqs: Master in Comp. Sci. or Engr. & 3 mos exp. Send resumes to: MDCD/ESA, PO Box 11170, Detroit, MI 48211-1170, Ref # 147599. Employer Paid Ad.

Programmer Analyst wanted by Info Technology Firm in Union, NJ. Must have BS in Electronics or Comp Sci & 5 yrs exp in Oracle dvlpt in Win NT or UNIX envrmt. Respond to: Patel Consultants Corp, 1525 Morris Ave, Union, NJ 07083.

PROGRAMMER-ANALYSTS (2) wanted by Telecom Co in Englewood, NJ. Must have Bach in Comp Sci or equiv. Respond to: Locus Telecommunications, Inc., 111 Sylvan Ave, Englewood, NJ 07632.

Fulltime Jr. Systems Analyst responsible for coding, designing and re-engineering of applications for the company and its clients using supercomputer environment. Write applications using C++, JAVA and RSA Cryptographic Algorithm. Must have a Bachelor's Degree in Telecommunications Engineering, CS or related field. Foreign degree equivalent accepted. Must have one year of experience in job offered or in a position with same duties. Salary: $62,000/yr. Send resume to Raj Shekaran at Software Research Associates, 70 Mansell Court, Suite 100, Roswell, Georgia 30076.

Programmer Analyst - Oracle Specialist - Multiple Openings

Structured systems analysis, design, development, testing, quality assurance, implementation, integration, maintenance and support of large volume on-line complex integrated client-sèrver based business, financial, banking, manufacturing and other commercial application systems in a multi-hardware/multi-software environment using centralized or distributed database systems using Oracle Relational Database Management Systems (RDBMS) and related software. Design of large application systems and databases in a Co-operative Development Environment (CDE); and analysis, design and development of applications using CASE (Computer Aided Software Engineering) tools. Bachelor's Degree (or equivalent) in Computer Science/Math/Engineering/Science/Business-Commerce and 1 yr. experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 3 of B, or 2 of A and 2 of B. A) includes Oracle RDBMS, Oracle CASE tools (Designer, Dictionary, Generator), CDE 2, Oracle Financials; B) includes PRO*C, SOL*Forms, SQL*Reportwriter, SOL*Plus, SQL*Menu, PL/SQL. High mobility preferred. 40 hrs/week, 8 am - 5 pm. $53,098 - $75,000 per year. Qualified applicants should contact or send resume to Ms. Mary Pat Curran, Supervisor, McKeesport/Allegheny Co. CareerLink, 345 Fifth Avenue, McKeesport, PA 15132-2600. Refer to Job Order #WEB 118856.

Client Server Developer/Analyst I - Analyze information gathered from the client regarding business and technical requirements and objectives. Design simple elements of the business logic for the client/server application. Design and develop elements or portions of graphical user interfaces (GUIs) and screens. Code the business logic, GUI interfaces and database interfaces using various programming languages. Research and resolve basic hardware and software problems and assist in designing the database structure. Develop and execute test plans for basic software enhancements and changes. Research and stay current on client/server related issues and technologies. Requirements: Bachelor's degree in Comp. Sci., Engin., Math, or Information Systems and either one year of exp. in job offered or one year of exp. in software and/or system analysis and/or design. 40 hrs/wk, M – F, 8:00 am – 5:00 pm. Salary: $45,980 per year. Apply to the LA Dept. of Labor, 1530 Thalia Street, New Orleans, LA 70130. (Job Order # 1683158)

ENGINEERING

The San Francisco office of Charles Schwab & Co., Inc. has staff, Sr. Staff and Director career opportunities in Schwab Information Technology Enterprise. Specific disciplines include Database Administration, Systems Programmers, Programmer Analysts, Information Security Specialists, System Administrators, Architects, Project Managers, Systems Engineers and Network Engineers. Technical Environments: NT, UNIX (Solaris, AIX, HP-UX), MVS, CICS, CICS/6000, SNA, C, C++, COBOL, Powerbuilder, SQL DB2, Oracle, Peoplesoft, Firewalls, Visual Basic, Java, Javabeans, Activex, J++, CGI Scripting, HTML, SILK, QA Partner, CORBA, DCE, HP-Openview, Newbridge, Tivoli, Remedy, Legato, Periphonics, CTI, Parallel Sysplex, LDRPS, MQ, NetIQ, ATM, PBX, Electronic Output, Cisco, Sendmail, Imaging, Electronic Messaging, AFP. We offer the competitive salaries, excellent incentives and the comprehensive benefits of a recognized industry leader. Email your resume, indicating Job Code SK/99IC to: schwab.jobs@schwab.com. Charles Schwab & Co, Inc. member SIPC/NYSE. 0300-5070. Equal Opportunity Employer.

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IT Professionals with a min. of 2 yrs. industry experience in (A) or (B) or (C) or (D) or (E) or (F) or (G) or (H) needed (A): MVS/ESA, Librarian, Platinum, Natural, Easytrieve, Adabas, VS Cobol II; (B): Unix, UML, Rational Rose, Visual Age, Vision, SOL Server, JSP, Process Model; (C): Designer 2000, ERWin, Import/Export, FoxPro, Dbase, Manufacturing System; (D): Lotus Notes, Unix, Domino, WebSphere Technology; (E): Oracle DBA, SOL*Loader, SOL*Net, Perl, XML, Tivoli, AIX, Unix, JFS, DCE; (F): IMS, DBDC, Changeman, Expeditor, Endeavor, QMF, Cobol 370; (G) Interest, Smart Test, Key, MVS/ESA, Platinum, Install/1, Changeman, Cogen, Java; (H): Lawson Financial Suite, Unix, Lawson Cobol, Perl, C-Shell, K-Shell, Net Express. Travel req'd. Please send resume & salary reqmnts. to HR, OST International Corporation, 1300 Iroquois Dr., Ste. 255, Naperville, IL 60563.

Software Engineer to research, design and develop computer software systems in conjunction with hardware product development. Develop and direct software system testing procedures, programming and documentation The candidate should be well versed in all phases of software development life cycle, able to design and develop commercial applications using object-oriented GUI development tools. Should be technically sound with hands on experience in building Client-Server applications and distributed applications using C++, PowerBuilder, Visual Basic, Oracle & SOL Server on Windows NT/95/98 platforms. Requirement: A Bachelor's degree in Computer Science, engineering or closely related field and five years of experience. Salary $70,000 per year. Send resume to Pyramid Consulting Inc., 5335 Triangle Parkway, Suite 510, Norcross, GA 30092.

Systems Analyst. Multiple positions available. Master's Degree or equivalent in Computer Science, Math, Science, Engineering or similar field with three years of experience in systems analysis for systems and web-enabled client/server & Internet/Intranet applications. Bachelor's Degree in Computer Science, Math, Science, Engineering or similar field and five years of progressive experience will substitute for Master's Degree. Responsibilities include managing a team in designing, developing and implementing functional specifications of Computer Software Systems using object-oriented analysis; reviewing and analyzing status reports; ensuring that projects meet client specifications; ensuring timely delivery of E-R/Context diagrams following normalization processes; designing structure charts for the development of the server and client applications; incorporating Open System Foundation ("OSF") architectures to ensure rigid conformance to standards; working in UNIX Relational Data Base Management Systems ("RDBMS") and Windows or motif applications environments and in RDBMS areas of Sybase and Oracle; ensuring compliance with ISO Ouality Management System and SEI CMM Level 3 processes. Requires proficiency in Internet Bill Presentment and Payment Application. Must have systems analysis experience utilizing Visual Basic 5.0, C, C++, GUI Tools, Java, Object Oriented applications, Oracle 7.3 server or higher, PowerBuilder, MS-Access or ER Win Database Design Tool. Must be willing to travel. Salary $70,000 to 75,000/yr, depending upon experience and responsibilities. Send resumes to NIIT (USA), Inc., 1050 Crown Pointe Pkwy, Suite 900, Atlanta, GA 30338, Attn: Human Resources, or fax resumes to 770-551-9237, Attn: Human Resources.

STAFF PROGRAMMER IN SYSTEMS - Must have BS in Computer Systems or related. Must have 9 months experience in job offered or 9 months experience in job related as Systems Analyst. Prepare and maintain systems to analyze comparison reporting data for the poultry industry. Solve operational problems and rewrite code to correct errors. Analyze errors in the company systems (written in Clipper) discover source of errors and make corrections. Convert customer file formats to company system for processing using different database manager software (Clipper, Fox Plus, DBU, UI). Analyze and solve system problems using Project Management (including Analysis, Design and Implementation). Develop test routines and sample tests data to ensure system and data accuracy using statistical principles. Debug programs by analyzing memory dump, using clipper debugger software, alter program steps. Use Netware Novell platform to discover system errors. Prepare new programs in Delphi 4.0 to establish compatibility with our programs and systems made in Clipper. Provide services to customers located in Mexico and Latin America. Translate data processing manuals (English to Spanish and Spanish to English) for both customers and company use, fluent in Spanish. 40 hours per week, 8:00 am to 5:00 pm. Salary $35,200 per year. Oualified applicants send resumes with social security number to the Indiana Department of Workforce Development, 10 N. Senate Ave., Indianapolis, Indiana 46204-2277, Attention: DPG. ID # 8086288.

Managing Consultant

Responsible for developing strategy and overseeing delivery of all projects relating to the implementation of technology in support of utility restructuring with emphasis on retail access in the electricity, gas and water industries. Duties include product and delivery strategy, solution architecture and process, project bid management, contract negotiation and management of resources and budgets to deliver company profitability targets. Must be willing to travel internationally approximately 80% of the time. 5 years' exp. in position offered or 5 years' exp. in technology delivery management to the utility industry in the US/UK required. $160,000/yr.

Please forward your resume to: Human Resources Department at careers@logica.com or fax to: (617) 476-8624. www.logica.com

EOE

Systems Analyst for computer consulting services company in the Chicago area. Job duties: analysis, design & programming for mainframe based systems for financial, accounting & inventory applications using COBOL II in both CICS & Batch Database2 environments; lead in the full project cycle including developing requirements, code & text, develop a thorough test plan & implement design modifications. Tools used: Install-1, Design-1, COBOL, CICS, DB2, JCL, TSO/SPF, SQL, MVS-ESA, Platinum, FileAid, SPUFI, Intertest, Xpeditor. Applicant must have MBA or MS in MIS or Finance or Computer Science & 1 yr exp in job duties or 1 yr exp as systems analyst for business processes which included design & analysis of the data model, design & implementation of financial applications using Install-1, Design-1, COBOL II, MVS-ESA, CICS, JCL, TSO/ISPF, SQL, DB2 (or SYBASE), SPUFI (or Platinum), Intertest, Xpeditor, FileAid. The 1 yr must include at least 6 mos exp with migration of system environments from mainframe based to client-server based platform. 40 hrs/wk, 8:00am-5:00pm, Mon-Fri, $65,000.00/yr. Applicant must show proof of legal authority to work in the U.S. Send resumes to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, Illinois 60605, Attention: Lydia Clarke, Reference #V-IL 23036-E. AN EMPLOYER PAID AD. NO CALLS - SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

Network Systems & Data Communications Consultant: Analyze, plan, specify & implement high speed data network, Distributed Computing on high-end Advanced Cisco Routers with IP, IPX, DEC, LAT, Authentication Technologies, X.23, Leased Circuits, Frame Relay & VP Cisco ACRC-EIGRF & OSPF. Research, design & develop complex Switched Network Processing/distributed computing on NT, NetWare, AS/400, DEC, UNIX-BSDI, SVR4-ICL, DRS6000 with Novell SAA Gateway. Calculate fault-tolerant restoration paths/communication architectures in WAN & test fault-tolerance-Disk Duplexing Mirroring, XVision, LANArc, Multiple-NICs on LANImage Mirroring Servers, Cheyyne ARC-Server Cabletron, MMAC-M8FNB, 3COM, Catalyst 2820, 5000 Switches, VLAN with Novell SAAGateway, NMS-Network & SPMA for NMS on Cabletron. Implement Netware IPX/SPX Listener configuration with Attachmate IPX/SPX based IBM 5250 Emulation, BIND DNS, PPP RAS, NetBT, Dynamic Host Configuration Protocol, bootp, & WebRanger Router. Evaluate & implement Distance Vector Routing Multiprotocol Network Addressing on Cisco Routers, Apple Talk Enhanced IGRP, DEC VT to IBM3270. Implement NETSync- bindery to NDS. Administer HPOpenview NMS, Novell NDS, WWW & NWLink Servers. $80,000.00/yr. 40 hrs./wk. M.S. or equivalent in Physics, Electronics Engg, Computer Electronics & 2 years exp. in job offered or related field or 2 years related exp. as a Network Engineer or Network Analyst. Exp. in related occupations must include proven knowledge & ability to perform job duties & must be Cisco certifiable, Master CNE & MCPS certified. BS and 5 yrs. exp. acceptable in lieu ot M.S. & 2 yrs. exp. Job Location: Norwood, MA. May work at unanticipated locations in the U.S. Submit 2 copies of resume to: Case # 19990941, Labor Exchange Office, 19 Staniford Street, Hurley bldg. 1st Fl., Boston, MA 02114.

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University of Illinois
Electronic Business Application Development Specialist
Springfield Campus

Applications are invited for the position of Electronic Business Application Development Specialist, located on the Springfield Campus of the University of Illinois, Office of Business and Financial Services.

The Electronic Business Application Development Specialist reports to the Assistant Director of Business Systems Analysis. Responsibilities include: design and develop web-based financial transaction applications; support the integration of real time web-based transaction capabilities for various UI applications; provide application development for university-wide UI retail web strategies; provide technical support and development of smart card and other high-level security applications; assist with the application development for Integrated Circuit Cards (smart cards) and other related projects; work with other related application development teams to establish and maintain technical and support standards for enterprise and business-related systems; meet with other UI administrative and academic application development staff to establish networking and support for electronic business applications.

Candidates should possess a Bachelor's Degree in information systems, computer science, business, or other related field, plus a minimum of three years experience in database design, strong working knowledge of Microsoft Windows NT, Microsoft SOL Server RDBMS, Perl, and web development using real time query is required.

Salary is commensurate with qualifications and experience. Position is available immediately. To assure full consideration, a current resume, including names, addresses and phone numbers of three professional references, should be submitted by September 8, 2000 to:

Ms. Janier Koss
University of Illinois
Office of Business & Financial Services
~~342 Henry Administration Building~~
506 S. Wright Street
Urbana, IL 61801

Phone: 217-333-2497
Fax: 217-244-5821
E-mail: jkoss@uillinois.edu
~~job description: http://www.oba.uillinois.edu/positions/~~

The search will continue until the position is filled. The University of Illinois is an Affirmative Action, Equal Opportunity Employer.

Zillions Tech has multiple positions for Union City CA and unanticipated locations throughout the US. Following require BA/BS and 2 yrs post-degree exp: Programmers, Systems, Telecom Analysts. Following require BA/BS degree and 5 yrs post-degree exp: Sr Programmers, Systems Analysts; Project Managers, Sr Software, Telecom Engineers; Database, Systems Admins. Send resume: Zillions Tech HR; 2900 Flint St; Union City, CA 94587. No calls EOE.

Information Technology

We are GE Asset Management, a wholly owned subsidiary of GE, and a multi-asset class investment firm with $100 billion+ in assets under management. And just as we understand the benefits of financial investing, we are committed to investing in the professional development of our employees.

Systems Analysts
Your responsibilities will include participating in the integration of vendor applications including system analysis, testing and documentation, development of internal applications and technical support for portfolio managers and traders.

The successful candidate will have a Bachelor's degree in computer science or a related field, 2+ years of life cycle application development in a team environment and strong interpersonal skills. Knowledge of databases including Sybase, Oracle, SOL Server, stored procedure, and object oriented languages required. In return for your expertise, we offer a competitive salary, and comprehensive benefits. For confidential consideration, please send your resume with salary history and requirements to: Human Resources Manager, GE Asset Management, 3003 Summer Street, Stamford, CT 06904-7900; fax 203-326-2399. No phone calls please. An Equal Opportunity Employer.

GE Asset Management

Opportunities exist at various levels for the following positions.

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- ☐ **Financial Analysts**
- ☐ **Technical Support Analysts**
- ☐ **Business Development Managers**
- ☐ **Marketing Representatives (International)**
- ☐ **Telecommunications Analysts**

Salary is dependant upon experience. Openings exist in El Segundo, CA; Clark, NJ; and New York, NY. Please submit resumes to: **Infonet, Attn: Bernard Hodes, 340 Main Street, Venice, CA 90291.** Equal Opportunity Employer.

Design Engineer: Research, analyze, simulate, place and route VHDL, using Altera Maxplus 2 tor Pentium PCs. Using digital hardware, ASIC, Mentor Idea Station, Graphics, Mentor EDA Systems, & PLD Synthesis, capture, simulate & implement PRF EPLD using Altera Maxplus2 on EPLD. Design ESM processor subsystem of a EW system. Design & develop VLSI devisces (ASIC &FPGAs) & using EDA tools, simulate, synthesize, layout & route static timing analysis, test vector generation & post layout simulation on HP 9000 & Sun Workstations. Using Mentor Grpahics Electronic Automation Tools, Logic State Analyzers, Emulators, Scope & Microprocessor Development Systems (MDS), design an Electronic Intelligent System to handle different types of emitters including pulse, frequency agile, PRF Staggered & CW. Design an intelligent data acquisition card as a PC based add-on card to a remote controlled pilotless vehicle. Design, simulate, synthsize, time-analyze, layout & route Complex Programmable Logic Devices. $72,000.00/yr. 40 hrs./wk. M.S. or equivalent Electronics Engineering, Electrical Engineering & 2 years exp. in job offered or related field or 2 years related exp. as a Hardware Engineer or Systems Engineer. Exp. in related occupations must include proven knowledge & ability to perform job duties & must be Cisco certifiable, Master CNE & MCPS certified. BS and 5 yrs. exp. acceptable in lieu of M.S. & 2 yrs. exp. Job Location: Norwood, MA. May work at unanticipated locations in the U.S. Submit resume to: Case # 19991313, 19 Staniford Street, Hurley bldg. 1st Fl., Boston, MA 02114.

Openings available for the following positions:

Module Configurer-
Exp. configuring one or more SAP modules: FI/PA, SD, AR, G/L, IM, A/P, MM or WF.

ABAP Developer-
Exp. programming in ABAP/4. Exp. with one or more SAP modules: SD, MM, A/P, P/O, or FI.

IDoc Developer-
Exp. with SAP IDoc development. Must have SAP ALE, EDI & Workflow exp. In addition to ABAP programming exp.

IS Specialist, MQ Series Administrator-
Exp. with MQSeries & MQSeries Link for R/3 plus systems level exp. in one or more environments: NT, HP-UX, VSE, OS390, AS400 or CICS.

Client Server Systems Analyst-
Eptechnical support in computer industry. Exp. in one or more platforms: UNIX, NT, or AS400 at the systems level.

SAP Mercator Developer-
Mercator exp. and/or exp. with data mapping with other mapping tools (i.e. Harbinger, GENTRAN). Also exp. with MQSeries and SAP ALE/EDI IDoc exp. Send resume to Mary Lou Simo, Nestle USA, Inc., 800 N. Brand Blvd., Glendale, CA 91203

INFOTECH CONSULTING, INC.

Software Engineers, Developers

A multi-million dollar consulting firm is seeking qualified technical professionals with 4-yr. college education & 5+ yrs. exp. or MS in Computer Science/Related Subjects & 2+ yrs. exp.:

- Java, EJB, Severlets, JSP, PI/SQL, Application Server, UNIX (Solanix), HTML & JavaScripts
- C++, PL/SQL, Application server
- XML, (DOM, SAP), Java & C++ Parser
- OOPS, CORBA, ORDBMS Concepts
- Oracle Applications (Financials)
- Actuate Web Reporting

Also looking for **PROGRAMMER/ANALYSTS** with a Bachelor's & 2 yrs. of exp. in analysis, design, development, implementation & maintenance of software applications in the above listed areas. Candidates must be willing to travel & relocate. Send resume to: Recruitment CWW, Infotech Consulting, 3461 Market St., Ste. 303, Camp Hill, PA 17011 fax: 717-731-9857; e-mail: hsingh@icibsl.com. Visit our web site at http://www.icibsl.com

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Systems Analyst in analyzing user requirements, procedures and problems to automate processing or improve existing computer system. The candidate should be well versed in all phases of software development life cycle, able to design and develop commercial applications using object-oriented GUI development tools. Should be technically sound with hands on experience in building Client-Server applications and distributed applications using VC++/MFC, C++, ASP, CGIs, HTML/DHTML, Java Scripting, SQL Server, ODBC and Oracle on UNIX, Windows NT/95/98 platforms. Requirement: A Bachelor's degree in Computer Science, engineering or closely related field and two years of experience. Salary $64,000 per year. Send resume to Pyramid Consulting Inc., 5335 Triangle Parkway, Suite 510, Norcross, GA 30092.

ITcareers

Software Engineer. Develop software application using C, C++ and Java languages; develop software applications using industry standard OpenGL Application Programming Interface (API); develop software applications using advanced computer graphics APIs; develop Graphical User Interface (GUI) software applications using GUI APIs and tools; research and develop Head Up Display (HUD) simulators for civil aviation; develop software applications using advanced 3D graphics methods; develop digital terrain databases using computer graphics database tools. MS in Computer Science; must have successfully completed Computer Graphics and Human Computer Interaction courses. 40 hours/wk, 8:00 a.m. to 5:00 p.m., $55,782.48/yr. Must have proof of legal authority to work in the United States. Send resume to the Iowa Workforce Center, 800 Seventh Street SE, Cedar Rapids, Iowa 52406-0729, Ref. #IA1101102. Employer Paid Ad.

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PROGRAMMER/ANALYST, ENGINEERING AND SCIENTIFIC: Designs and implements an off-line and on-line optimization and modeling system using equation-based techniques for the processing industries. Performs research in Mixed Integer Nonlinear Programming techniques and interior-Point method for Large-Scale processing optimization problems. Designs software products incorporating the research results, using FORTRAN, C AND C++. Requires Ph.D. in Applied Mathematics or Computer Science with 1 yr. exp. on job offered or 1 yr. related exp. involving interior point method, integer programming and nonlinear programming. $65,000/yr., 40-hrs. wk. Apply at Texas Workforce Commission, Houston, Texas, or send resume to 1117 Trinity, Room 424T, Austin, Texas 78701, J.O. #TX0944687. Ad Paid by An Equal Opportunity Employer.

◆

STRUCTURE CONSULTING GROUP LLC is seeking professionals at various levels of employment, including managerial, in the following positions:
Consultants
Developers/Programmers
Programmer/Analysts
System Dsgn/Dvpmnt Team Lead
Some positions require relevant experience with development/programming/consulting. Some positions also require travel to our various offices and client sites throughout the U.S. Send your resume to SCG, 98 Main Street, Suite 300, Tiburon, CA 94920 or email to hireme@scgo.com. For further info on our company & additional career opptys, visit our website at www.scgo.com. EOE

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e-business Architects & Software Developers/Analysts: DigitalESP provides a full range of e-business services to companies, including e-business strategy, e-business and enterprise architecture design. We seek e-business Architects and e-business Software Developers/Analysts to develop B2B e-business solutions for our clients. We seek candidates with expertise in developing secure transactional systems including integration of divergent open standards and protocols into an integrated digital supply chain. Positions available in San Francisco, CA and New York, NY areas and at our headquarters in Raleigh, NC. E-mail credentials to Nancy Hill nancyh@digitalesp.com or fax to (919) 878-6695.

VW Credit Inc. (VCI), a finance company, is seeking a Senior Systems Analyst, Quality Assurance for its Libertyville, Illinois facility. The successful candidate will be responsible for quality assurance and quality control of software, for facilitating and managing IT projects, recommending best practices and tools. Qualified candidates will possess a BS degree in Computer Science or related field, have 2 years experience in systems analysis and quality assurance, have experience in automotive receivables software and development of multi-user, client-server and web-based systems. Interested candidates should send their resume and salary requirements to: VCI, 1401 Franklin Blvd., Libertyville, IL 60048, Attn: Randy Viola. No phone calls please. VCI is an equal opportunity/Affirmative Action Employer.

SOFTWARE ENGINEER
Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in ASP, Visual Basic, Crystal Reports and Oracle. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and five years experience as a software engineer or computer programmer, knowledge of ASP, Visual Basic, Crystal Reports and Oracle. Salary: $100,289 /year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Terry N. Faust, Washington County Team PA CareerLink, Millcraft Center, Suite 150LL, 90 West Chestnut Street, Washington, PA 15301-4517, Job No. WEB118755.

SOFTWARE ENGINEER
Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in ColdFusion, Visual Basic and SQL Server. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and one year of experience as a software engineer or computer programmer, knowledge of ColdFusion, Visual Basic and SQL Server. Salary: $66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Ms. Barbara Cole, Greene County Team PA CareerLink, 4 West High Street, Waynesburg, PA 15370-1324, Job No. WEB118750.

Programmer Analyst. Design, develop, analyze and implement client server based applications on multiple environments. Demonstrated ability working with programming languages such as C, Pro*C. demonstrated ability working with Oracle and SQL*Plus on multiple platforms such as Unix, DOS, Windows NT. Knowledge working with Visual Basic and Sybase, C++, PL/SQL. $76,252/yr. 40 hr/wk. 9 a.m. - 5 p.m. Must have 5 years exp. (or 5 yrs. exp. in related occupation of Software Engineer) and B.S. in Comp. Sci., Eng., rel. field/equiv. Send 2 resumes: Case #20002600, Labor Exchange Office, 19 Staniford Street, 1st Fl., Boston, MA 02114.

Network Administrator. Job requires that applicant administer and maintain networks, provide help to users, be responsible for back-ups and archives, administer incoming and outgoing PC EDI processing, for main-frame, 3 servers, 3 remote stations, and approximately 100 PCs. Hours are 8:30 AM to 5:30 PM, Monday through Friday. Must have at least a high-school diploma, and four years of work experience in the job offered. Salary of $45,200.00 per annum. Send resume to Department of Labor, Bureau of Workforce Program Support, PO Box 10869, Tallahassee, FL 32302. JO FL 2107327.

Programmer Analyst. Design, develop, analyze and implement client server based applications using software development tools on multiple environments. Demonstrated ability designing, developing, analyzing and implementing applications using Java, PL/SQL, SQL. Demonstrated ability working with Oracle. Demonstrated ability working with Unix, Windows 95/NT. $65,000/yr. 40 hr/wk. 9 a.m. - 5 p.m. Must have 2 years exp. (or 2 yrs. exp. in related occupation of Software Engineer) and B.S. in Comp. Sci., Eng., rel. field/equiv. Send 2 resumes: Case #20002645, Labor Exchange Office, 19 Staniford Street, 1st Fl., Boston, MA 02114.

SOFTWARE ENGINEER
Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Lotus Notes, JavaScript and Domino. Requirements: Master's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of Lotus Notes, JavaScript and Domino. Salary: $72,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Ms. Sue Notarnicola, Fayette County Team PA CareerLink, 32 Iowa Street, Uniontown, PA 15401-3513, Job No. WEB118762.

Programmer Analyst. Design and develop software programs using various tools and languages. Design and develop web sites, and work with dynamic generation of HTML response pages using Java Script, VB Script, CGI, Perl, HTML. Demonstrated ability working with HTML. Demonstrated ability working with tools such as Java Script, VB Script, CGI, Perl. $54,892/yr. 40 hr/wk. 9 a.m. - 5 p.m. Must have 1 year exp. and B.S. in Comp. Sci., Eng., rel. field/equiv. Send 2 resumes: Case#20001583, Labor Exchange Office, 19 Staniford Street, 1st Fl., Boston, MA 02114.

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Programmer Analyst sought by S. Florida based company to assist in development and maintenance of select business applications using UNIX, Novell NetWare 4.x, Windows 95/NT 4.0, C, COBOL, Fortran, Pascal, Oracle V7.x, FoxPro, MS-Access, Developer/2000 v6.0, PL/SQL, and SQL*PLUS. Respond to: HR Dept., Cross Country Home Services, P.O. Box 551540, Ft. Lauderdale, FL 33355-1540.

◆

Programmer/Analyst sought by Margate,FL based company involved in software development. 40-hour week, 9AM-5PM, $55,388.00 per year. Design and develop new projects, maintenance and debugging of existing applications, provide customer support, create and manage databases, interface with clients regarding changes to the system. Bachelors degree and 2 years experience in job offered Submit Resume to:
Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302-0869. Re: Job Order No. FL-2108032

APL SYSTEMS ANALYST (requires travel throughout U.S.) to design, develop, implement & maintain Portfolio Accounting & Tax Lot Accounting System using APL systems.
Requirements: B.S. or foreign degree equivalent in Computer Science, Math, or Engineering; 3 year's experience as APL Systems Analyst or working in Actuarial Science; exp. must include 3 years' designing & developing software programs or applications using APL systems in a financial setting. Salary: $82,080. Send resume to KM-HR, CheckFree Services Corp., 6000 Perimeter Drive, Dublin, OH 43017, itcareers@checkfree.com Attn.: Job WW

Software Engineers

Neptune Technologies has immediate openings for:
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- Technical/Project Leads
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- VP of Engineering

Send/fax/email resume to
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Neptune Technologies
1800 Wyatt Dr #5
Santa Clara CA 95054
Fax: 408 982 9259
email:dbitz@neptune-tech.com
www.neptune-tech.com

LEAD SYSTEMS ANALYST/
PROJECT MANAGER

Identify, organize manager activities required to complete software development projects from definition phase through beta phase of systems development life cycle. Job site is in Oakland, California.

To apply, forward resume to Job Code - RADNSFCOOE, Shared Medical Systems, 51 Valley Stream Parkway, Malvern, PA 19355; fax: 610-219-8879, e-mail: human.resources@smed.com.

EOE. We are an Equal Opportunity/Affirmative Action Employer.

Programmer Analyst. Design, develop and implement software applications on multiple platforms and environments using IBMmainframe, Cobol, IMS DB/DC, DB2, VSAM, CICS, TSO/ISPF. Design, develop, test, document and implement software application systems, program specifications, flowcharts and system test plans. Demonstrated ability working with Cobol, CICS, DB2, VSAM, IBM 3090. $54,892/yr. 40 hr/wk, 9 a.m. - 5 p.m. Must have 6 months exp. and B.S. in Comp. Sci., Eng., rel. field/equiv. Send 2 resumes: Case#20001838, Labor Exchange Office, 19 Staniford Street, 1st. Fl., Boston, MA 02114.

Sr. Programmer Analyst sought by S. Florida based company to assist in the development and maintenance of select business applications, using Win NT 4.0, UNIX, Oracle 8.x/7.3, Developer 2000 ver6.0. SQL:*Plus 8.0, PL/SQL, SQL Loader, C, and C++; knowledge of project management principles and techniques in an Oracle CASE environment with extensive user interaction. Respond to: HR Dept., Cross Country Home Services, P.O. Box 551540, Ft. Lauderdale, FL 33355-1540.

Software Engineer. Develop software for a host-based simulation/debugging environment for product applications use using Ada, C++, and Delphi. BS in Computer Science or Computer Engineering; must have successfully completed C programming course. 40 hours/wk, 7:30 a.m. to 4:30 p.m., $45,000/yr. Must have proof of legal authority to work In the United States. Send resume to the Iowa Workforce Center, 800 Seventh Street SE, Cedar Rapids, Iowa 52406-0729, Ref. #IA1101103. Employer Paid Ad.

Software Engineers: Two openings in Atlanta GA to design, develop, implement & customize software programs for company's billing, provisioning & customer care systems using Progress 4GL/RDBMS Version 8 (Character) & an event driven programming model. Other duties include database design, maintenance, & performance tuning UNIX shell scripting, FTP, TCP/IP, UNIX networking & C programming. Req B.S. or equivalent in Comp Sci. or other related field w/2 yr. exp. in job offered. Resume to: Sr. Director, Systems Dvlpt. & Integration, Premiere Technologies, Inc., 3399 Peachtree Rd. N.E. Ste 600, Atlanta, GA 30326.

Programmer - Analyst, 40 hours per week, 9-5 P.M. $60,000 annually. Job located in Orlando, FL. 2 yrs exp in job offered. Bachelor's degree a major Computer Science, Engineering or Math. Analyze, design, develop, implement, test and maintain commercial and financial applications utilizing AS/400, RPG and CL. Send resume to Department of Labor, Bureau of Workforce Program Support, PO Box 10869, Tallahassee, FL 32302, Att: EH., JOFL 2111600.

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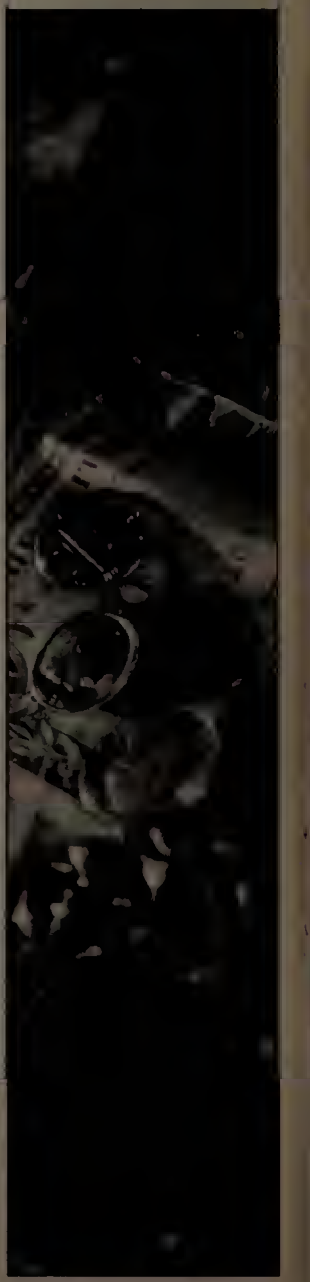

IT Careers in SAP

The hottest of the hot skills three years ago was a developer, programmer or integrator who knew the language of SAP. Today, SAP has remade itself as companies throughout the world are turning to the separate modules as a whole-system, web-enabled solution that works for a business from the moment contact is made with a customer through the back-office operations to support of products and services after they're sold.

It's a complex field, where experience in business and in implementation are critical to the overall success.

ExpertSeeker.com

Boonton, NJ

In the past four years, Atlas Technologies has grown by 2,000 percent in its business of providing information technology expertise to companies. In fact, the company takes on a new brand identity in January, that of ExpertSeeker.com. (On July 15, Atlas Technology launched ExpertSeeker.com through a virtual press announcement.)

The idea, according to company president, Stephen Halasnik, is to provide a one-stop shop for employers looking for high-level information technology permanent staff or consultants. ExpertSeeker.com bridges the gap of a job board with a staffing company by delivering the lightning speed of the Internet with the qualification process that only a human being can perform, thus giving hiring companies the ability to quickly bring on expert-level talent.

"Using our patented E-Resume process, clients go in and fill out a data sheet on the kind of person they're looking for. Then ExpertSeeker.com does the rest," says Halasnik.

It's more than a mere matchmaker game though. E-Resume provides clients with a URL address where they can go to look at a potential candidate's background – a summary of past experiences, a resume, a sound bite of the individual's technical interview, a photograph, completed reference checks and results of a technical test. "The client can then make a quicker, better-informed decision about bringing someone in," Halasnik says.

ExpertSeeker.com continues to search out experts to include in its database, including those with SAP skills. "We do not look for people who have just SAP ABAP programming skills. We're talking about someone who can help companies achieve their goals, identify what is needed to make the implementation a success and move the whole company forward. These experts are major problem solvers. Our customers are paying for experts who know what should occur, what could go wrong and how to make SAP work at its fullest.

"When searching for experts, our clients look on resumes for in-depth descriptions of projects. We used to be told that less is more in resumes. Not so anymore," he says.

"We look for resumes that define projects and the expert's exact role – what was the business issue and how did they respond?"

While ExpertSeeker.com does hire individuals as full-time employees, Halasnik says the majority of senior IT professionals want to be independent within the ExpertSeeker.com network.

"There are several reasons why an individual would prefer ExpertSeeker.com over any other firm that offers consulting-type engagements," he explains. "You'll be working with a firm that knows the IT industry in depth, and that offers high paying jobs. We get the best jobs, jobs that are critical to a company and that offer intellectual intrigue to you. While you're working, we're promoting you, giving you exposure as an expert to help you establish or further your reputation. We do this through our lecture series and through our dedicated sales force. Just like in Hollywood where all the stars have agents, we are your agent."

John Deere

Moline, IL

Anyone with experience around heavy equipment or farming knows the name John Deere. Less known is that this 160-year-old American manufacturer today is a worldwide provider of heavy equipment. Through acquisitions such as the recent purchase of Timberjack forestry equipment in Europe, the company is operating worldwide and has plans to grow at a tremendous rate over the next decade.

"We see SAP as a backbone system to support our business initiatives," explains Sheila Mixdorf, team leader for the SAP Technical Team. "We're currently rolling out the SAP systems globally, and over the next six months will further develop the systems to web-based applications." The objective is better business integration. "Our world presence requires integrated information and data," explains Mixdorf.

To address growth and the expanded use of integrated systems, Julia Mahoney-Hansen, information systems team leader within the Corporate Staffing Department, is working with Mixdorf to identify people who have technical SAP experience, but who also have experience with the multifunctional business processes served by SAP applications. "We need people who have a combination of business process and technical expertise in all of the SAP modules, as well as the cross-application tools such as Work Flow and Application Integration tools," explains Mixdorf. "This is end-to-end use of SAP as an enabler, from where we first touch the customer to total support following the sale."

Mahoney-Hansen says selling Deere to potential employees rests on several key points. "Deere has been around a very long time," she says. "Because of the breadth of the company, the global application, and the variety of challenges we offer, you can get the experience of working for several different businesses all within one company. You can assist with implementation around the world, or if you want to be closer at home, we can offer those opportunities, too. One thing we make clear to everyone is that you will have the opportunity for multiple job changes and challenges. That makes this company a great place to be."

For more job opportunities with SAP companies, turn to the pages of IT Careers.

If you'd like to take part in an upcoming IT Careers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.

Produced by Carole R. Hedden • Designed by Aldebaran Graphic Solutions, Inc.

AD INDEX

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Computerworld Headquarters:
500 Old Connecticut Path, PO Box 9171, Framingham, MA 01701-9171
Phone: (508) 879-0700, Fax: (508) 875-4394

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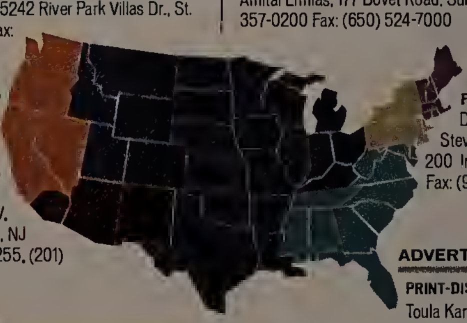

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Laureen Austermann
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Company	Percent
Legato Systems Inc.	32.3
Globalstar Telecom. Ltd.	28.1
Storage Technology	27.9
Auspex Systems	25.7
Network Equipment Tech.	21.8
Call-Net Enterprises	20.8
Wind River Systems Inc.	19.6
Network Computing Dev	17.1

DOLLAR

Company	Dollar
Juniper Networks Inc. (H)	16.44
NEC	11.38
Businesss Objects S.A.	11.06
Hitachi Ltd.	9.63
Yahoo Inc.	9.06
Veritas Software Corp.	7.75
Hewlett-Packard Co.	7.69
Intuit	7.63

LOSERS

PERCENT

Company	Percent
American Mgt. Systems (L)	-33.2
Renaissance Worldwide	-18.3
Macromedia Inc.	-15.9
ADC Telecommunications Inc.	-13.5
Antec	-12.3
Verilink	-11.4
Sapient Corp.	-11.2
Wink Communications Inc.	-11.0

DOLLAR

Company	Dollar
Sapient Corp.	-14.19
Macromedia Inc.	-12.31
American Mgt. Systems (L)	-7.78
Dst Systems Inc.	-6.56
ADC Telecommunications Inc.	-5.88
Nextel Communications	-5.44
Antec	-5.25
Alltel Corp. (L)	-5.00

Spin-offs May Risk Spinning Out of Control

Analysts advise against isolated online divisions

BY JULIA KING

INDUSTRY ALMANAC

COMPANIES OFFER all sorts of reasons for spinning off Internet-related activities into separate business units.

Chicago-based Bank One Corp. [NYSE:ONE] saw its creation of WingspanBank.com as the fastest way to get into the Internet banking business.

DTE Energy Co. [NYSE:DTE] in Detroit created DTE Edison America to attract much-needed venture funding and top-notch employees.

But investors need to look beyond the short-term benefits of such spin-offs. Most of these ventures have yet to go public, and those that have are showing that they're not necessarily sure bets.

Barnesandnoble.com Inc. [Nasdaq:BNBN], for example, has declined from $19 per share last summer to the most recent price of $4.07.

Companies must also consider how each spin-off is setting up its computer systems, according to John Ekoniak, a San Francisco-based analyst at U.S. Bancorp Piper Jaffray Inc.

"We're seeing cases where some companies are creating entirely new systems that do not communicate with the computer systems in a company's other divisions," Ekoniak notes. In doing so, they're injecting a costly layer of complexity, inefficiency and costs that will come back to haunt them, he adds.

Barnesandnoble.com, which was spun off from Barnes & Noble Inc. [NYSE:BKS], learned that lesson the hard way, says Bobby Cameron, an analyst at Forrester Research Inc. in Cambridge, Mass.

Initially, "they didn't bother to integrate [their online operation] back to the mother ship, so the SKUs were different, and you couldn't order a book online [and] then pick it up in one of the stores," Cameron says.

Don Larson, vice president of applications at Staples Inc.'s [Nasdaq:SPLS] Staples.com Internet division in Framingham, Mass., describes the spin-off's computer systems as "the best of both worlds."

"The Web environment and the firewall are specific to Staples.com, but all of our back-end systems for merchandising, catalog lookups and product data information is all shared with our catalog business," he says. ◗

Sample Spin-offs

Company: **Bank One Corp.**
E-business unit: WingspanBank.com
Created: June 1999
Activity: Internet banking

Company: **Visa USA**
E-business unit: E-Visa
Created: September 1999
Activity: Online payment via electronic-wallet technology

Company: **Barnes & Noble Inc.**
E-business unit: Barnesandnoble.com Inc.
Created: May 1997; initial public offering in March 1999
Activity: Online book sales

EXCH	52-WEEK	RANGE		AUG. 25 2 PM	WK NET CHANGE	WK PCT CHANGE
SOFTWARE UP 5.0%						
ASWX	149.12	11.00	Active Software	51.00	0.00	0.0
ADBE	143.31	41.25	Adobe Systems Inc.	128.31	6.81	5.6
ARBA	183.34	16.56	Ariba Inc.	146.50	6.25	4.5
AZPN	55.37	8.12	Aspen Technology Inc.	49.81	4.44	9.8
ADSK	56.06	17.00	Autodesk Inc.	26.94	2.88	11.9
AVIO	25.56	8.75	Avid Technology	13.00	0.50	4.0
BAANF	16.25	1.12	Baan Co. N.V.	2.47	-0.03	-1.3
BMCS	86.62	16.12	BMC Software Inc.	25.44	0.25	1.0
BOBJ	150.87	18.50	Businesss Objects S.A.	97.94	11.06	12.7
CDN	24.62	9.18	Cadence Design Systems	19.94	-0.06	-0.3
CHKP	147.50	14.40	Checkpoint Software Techn. Ltd.	132.00	4.00	3.1
CTXS	122.31	14.25	Citrix Systems Inc.	22.81	2.94	14.8
COGN	46.50	9.68	Cognos Inc.	40.00	1.13	2.9
CA	79.43	23.68	Computer Associates Int'l Inc.	29.00	0.50	1.8
CPWR	40.00	7.50	Compuware Corp.	8.22	-0.44	-5.1
DCTM	106.00	13.75	Documentum	64.88	7.50	13.1
EFII	69.31	21.06	Electronics For Imaging	26.44	2.19	9.0
HNCS	130.00	29.87	Hnc Software	45.63	2.50	5.8
HYSL	65.00	15.12	Hyperion Software	29.31	2.19	8.1
IDXC	49.12	10.37	IDX Systems	16.63	-0.03	-0.2
INFA	110.87	16.06	Informatica Corp.	84.31	3.41	4.2
IFMX	21.25	3.68	Informix Software Inc. (L)	5.25	0.50	10.5
INTU	90.00	22.50	Intuit	53.94	7.63	16.5
JKHY	54.50	15.50	Jack Henry Associates	43.00	0.38	0.9
JDEC	48.31	10.25	J.D. Edwards & Co.	23.00	-0.13	-0.5
LGTDE	82.50	8.12	Legato Systems Inc.	11.00	2.69	32.3
MACR	120.87	27.37	Macromedia Inc.	65.25	-12.31	-15.9
MANU	70.25	9.06	Manugistics Group Inc.	57.50	1.13	2.0
MENT	21.00	7.75	Mentor Graphics	19.69	0.31	1.6
MSFT	119.93	60.37	Microsoft Corp.	70.81	-0.06	-0.1
NETA	37.18	15.00	Network Associates	23.00	3.19	16.1
GMH	46.66	16.25	Network General	33.75	3.00	9.8
NOVL	44.56	7.87	Novell Inc.	10.94	1.25	12.9
ORCL	90.00	17.34	Oracle Corp.	85.38	2.38	2.9
PMTC	35.93	7.37	Parametric Technology Corp.	12.75	0.94	7.9
PSFT	27.75	12.00	PeopleSoft Inc.	27.50	3.13	12.8
PIXR	50.37	31.31	Pixar (L)	32.75	1.00	3.1
RATL	113.75	26.37	Rational Software Corp.	110.00	5.19	4.9
RHAT	151.31	7.00	Red Hat Inc.	23.88	0.56	2.4
QSFT	98.12	7.00	Quest Software	53.25	-2.63	-4.7
SAP	85.93	29.37	SAP AG	62.38	1.38	2.3
SCUR	29.62	2.50	Secure Computing Corp.	22.56	-0.50	-2.2
SDRC	19.00	8.81	Structural Dynamics Research	15.38	0.31	2.1
SYBS	31.00	9.62	Sybase Inc.	24.88	0.13	0.5
SYMC	81.62	25.37	Symantec Corp.	49.38	0.63	1.3
SNPS	75.62	25.93	Synopsis	34.38	0.08	0.2
SCTC	28.37	10.00	Systems & Computer Technology	17.88	-0.13	-0.7
TIBX	147.00	6.58	Tibco Software Inc.	95.19	2.00	2.1
TSAI	48.12	11.37	Transaction Sys. Architects	18.25	-0.44	-2.3
VRTS	174.00	21.22	Veritas Software Corp.	116.44	7.75	7.1
WIND	66.12	13.37	Wind River Systems Inc.	40.00	6.56	19.6
TELECOMMUNICATIONS CARRIERS UP 0.9%						
AT	91.81	51.50	Alltel Corp. (L)	51.50	-5.00	-8.8
ANDW	42.06	11.18	Andrew Corp.	29.81	2.38	8.7
T	61.00	29.62	AT&T	31.00	-1.00	-3.1
BCE	137.50	21.06	BCE Inc.	22.44	-0.69	-3.0
BLS	53.50	34.93	Bell South	37.00	0.63	1.7
BRW	41.06	16.31	Cincinnati Bell Inc.	25.75	1.00	4.0
CMCSK	57.68	27.87	Comcast	38.31	-0.38	-1.0
COX	58.37	34.25	Cox Communications Inc.	35.69	-1.81	-4.8
GSTRF	53.75	5.81	Globalstar Telecom. Ltd.	10.69	2.34	28.1
NXTL	82.93	22.68	Nextel Communications	51.63	-5.44	-9.5
SPOT	74.25	28.25	Panamsat	32.63	0.50	1.6
QCOM	200.00	33.96	Qualcomm	58.44	-1.69	-2.8
SBC	59.87	34.81	SBC Communications	40.56	0.69	1.7
FON	75.93	30.25	Sprint Corp. (L)	32.38	0.06	0.2
TDS	137.00	65.81	Telephone and Data Systems	117.38	0.81	0.7
VIA	76.06	38.43	Viacom	69.13	0.13	0.2
WCII	66.50	24.00	Winstar Communications Inc.	30.44	-0.50	-1.6
WCOM	61.33	32.56	MCI Worldcom Inc.	35.94	1.38	4.0
SERVICES OFF -3.4						
ACXM	35.93	14.56	Acxiom Corp.	25.50	0.47	1.9
ACS	49.87	31.00	Affiliated Computer Servs	46.94	0.38	0.8
AMSY	44.37	14.00	American Mgt. Systems (L)	15.63	-7.78	-33.2
AUD	59.68	37.37	Automatic Data Processing (H)	58.44	0.13	0.2
BSYS	71.50	41.37	Bisys Group Inc. (H)	71.00	4.38	6.6
CATP	27.00	6.75	Cambridge Technology Ptnrs	7.75	-0.13	-1.6
CEN	29.93	14.75	Ceridian	24.88	0.44	1.8
CBR	29.81	9.50	Ciber Inc. (L)	10.13	-0.13	-1.2
CDO	57.25	17.43	Comdisco	23.50	0.13	0.5
CHRZ	27.12	9.50	Computer Horizons Corp. (L)	9.81	-1.13	-10.3
CSC	99.87	57.93	Computer Sciences	75.44	-1.06	-1.4
DST	100.25	51.18	Dst Systems Inc.	90.81	-6.56	-6.7
EDS	76.68	38.37	Electronic Data Systems	50.56	0.81	1.6
FDC	57.68	38.93	First Data Group	46.88	-2.94	-5.9
FISV	57.00	24.12	Fiserv	50.06	-3.84	-7.1
IT	23.12	9.58	Gartner Group	13.13	-0.63	-4.5
KEA	35.00	16.75	Keane (L)	17.63	-0.31	-1.7
NDC	43.00	20.75	National Data	29.44	-0.19	-0.6
PAYX	47.62	15.70	Paychex Inc.	43.06	-0.81	-1.9
PER	27.93	8.87	Perot Systems Corp.	10.69	-0.25	-2.3
REGI	9.75	1.25	Renaissance Worldwide	1.53	-0.34	-18.3
REY	33.00	15.93	Reynolds & Reynolds	17.63	0.44	2.5
SFE	99.00	15.85	Safegard Scientifics	26.56	3.13	13.3
SAPE	151.18	26.25	Sapient Corp.	112.63	-14.19	-11.2
SDS	40.00	18.87	Sungard Data Systems	35.38	-1.63	-4.4
SYNT	20.93	7.87	Syntel Inc.	9.38	0.00	0.0
TECD	52.12	18.00	Tech Data	46.88	-0.31	-0.7
TENF	76.87	8.75	TenFold Corp.	7.00	-0.81	-10.4
TSS	20.62	14.12	Total System Services Inc	16.88	-0.94	-5.3
TSAI	48.12	11.37	Transaction Sys. Architects	18.25	-0.44	-2.3
NETWORK UP 2.3%						
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ADCT	49.00	8.59	ADC Telecommunications Inc	37.50	-5.88	-13.5
ANTC	61.25	23.25	Antec	37.38	-5.25	-12.3
CS	52.75	11.12	Cabletron Systems	36.69	2.00	5.8
CNEBF	6.43	1.43	Call-Net Enterprises	2.00	0.34	20.8
CSCO	82.00	28.07	Cisco Systems Inc.	66.44	2.50	3.9
ECIL	39.87	23.75	ECI Telecom	31.88	1.06	3.4
ENTU	150.00	18.31	Entrust Technologies Inc.	25.00	1.38	5.8
EPRE	40.56	6.06	ePresence Inc.	6.94	0.06	0.9
HRS	39.37	15.50	Harris Corp.	29.25	-1.06	-3.5
GMH	46.66	16.25	Hughes Electronics/GM	33.75	3.00	9.8
ERICY	28.31	7.21	LM Ericsson	19.94	0.19	0.9
JNPR	194.25	24.33	Juniper Networks Inc. (H)	187.75	18.44	9.6
LU	84.18	39.62	Lucent Technologies	40.94	2.25	5.2
MADGF	17.37	1.43	Madge Networks	3.00	0.16	5.0
NCDI	9.62	1.03	Network Computing Dev	1.28	0.19	17.1
NWK	14.81	7.31	Network Equipment Tech.	11.19	2.00	21.8
NOK	62.50	19.26	Nokia Corp	41.75	0.31	0.8
NT	86.00	19.90	Northern Telecom Ltd.	82.81	-0.38	-0.5
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SFA	94.00	16.90	Scientific Atlanta	78.25	-1.56	-2.0
TLAB	77.25	41.81	Tellabs Inc.	58.31	-3.44	-5.6
VRLK	22.00	1.81	Verilink	7.75	-1.00	-11.4
WSTL	40.75	8.43	Westell Technology Inc.	17.25	0.88	5.3
SEMICONDUCTORS, CHIPS & EQUIPMENT OFF -0.6%						
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AMD	48.50	7.81	Advanced Micro Devices	33.88	-1.09	-3.1
ALTR	65.68	17.53	Altera (H)	63.75	-0.50	-0.8
ADI	100.00	20.81	Analog Devices	93.25	-1.44	-1.5
AMAT	115.00	31.12	Applied Materials	83.38	-1.25	-1.5
ASML	50.25	17.83	ASM Lithography Holding	39.50	-0.75	-1.9
FCS	49.50	18.50	Fairchild Semiconductor Corp.	40.50	0.06	0.2
HRS	39.37	15.50	Harris Corp.	29.25	-1.06	-3.5
INTC	74.87	32.50	Intel Corp. (H)	73.38	1.81	2.5
KLAC	97.75	29.90	Kla Instruments	58.97	2.41	4.3
LLTC	74.75	27.62	Linear Technology	68.63	-0.28	-0.4
LSI	90.37	21.56	LSI Logic	37.88	-2.50	-6.2
MXIM	84.75	30.31	Maxim Integrated Products (H)	83.50	1.19	1.4
MU	97.50	27.53	Micron Technology	89.63	0.44	0.5
MOT	61.54	27.33	Motorola	35.56	-0.81	-2.2
NSM	85.93	22.06	National Semiconductor	42.63	-2.44	-5.4
STM	73.87	21.27	SGS-Thomson Microelectronics	60.13	-2.50	-4.0
SLR	49.50	28.25	Solectron Corp.	44.75	0.38	0.8
TER	115.43	26.93	Teradyne	67.63	-0.56	-0.8
TXN	99.78	33.78	Texas Instruments	67.50	-2.56	-3.7
JOSU	153.42	20.25	Uniphase	125.31	2.69	2.2
VTSS	115.68	31.37	Vitesse Semiconductor Corp	88.63	6.50	7.9
XLNX	98.31	30.06	Xilinx	90.50	2.72	3.1
COMPUTER SYSTEMS UP 4.5%						
AAPL	75.18	26.06	Apple Computer Inc.	56.88	6.06	11.9
ASPX	19.00	3.87	Auspex Systems	8.88	1.81	25.7
BEOS	39.56	3.28	Be Inc.	4.59	0.47	11.4
CPQ	34.18	18.25	Compaq (H)	33.75	0.63	1.9
DELL	59.68	35.00	Dell Computer Corp	38.81	0.25	0.6
GTW	84.00	36.56	Gateway 2000 Inc.	66.56	2.56	4.0
HWP	155.50	67.00	Hewlett-Packard Co.	118.94	7.69	6.9
HIT	164.50	92.00	Hitachi Ltd.	122.75	9.63	8.5
IBM	137.68	89.00	IBM	128.38	7.31	6.0
MUEI	20.68	8.18	Micron	11.44	0.00	0.0
MOT	61.54	27.33	Motorola	35.56	-0.81	-2.2
NATI	59.50	25.50	National Instruments Corp.	44.06	-1.06	-2.4
NCR	47.00	26.68	NCR	38.81	3.25	9.1
NIPNY	162.00	72.62	NEC	148.88	11.38	8.3
PRCM	89.75	5.62	Procom Tech Inc.	46.00	1.63	3.7
SGI	17.68	3.06	Silicon Graphics Inc.	4.81	0.00	0.0
SNE	157.37	59.00	Sony	104.13	6.44	6.6
SUNW	128.62	32.93	Sun Microsystems (H)	125.56	3.13	2.6
TRCD	23.37	2.75	Tricord Systems	12.13	-1.25	-9.3
UIS	49.68	9.12	Unisys	10.88	-0.25	-2.2
INTERNET UP 2.6%						
AMZN	113.00	27.87	Amazon.com	38.94	-0.88	-2.2
AOL	95.81	38.46	America Online	60.31	5.25	9.5
ATHM	59.75	12.87	@home Corp.	13.88	-0.88	-5.9
CKFR	125.62	23.12	Checkfree	48.00	0.06	0.1
CYCH	16.00	3.62	Cybercash Inc	5.19	0.44	9.2
EBAY	127.50	35.14	eBay Inc.	62.25	2.38	4.0
ETYS	86.00	3.87	eToys Inc.	4.13	0.06	1.5
EGRP	40.00	13.12	ETrade Group Inc.	17.00	0.13	0.7
LCOS	93.62	28.56	Lycos Inc.	64.50	3.50	5.7
OMKT	65.50	6.00	Open Market Inc.	7.75	0.56	7.8
OTEX	60.62	9.50	Open Text Corp.	28.75	2.88	11.1
PCLN	104.25	22.62	Priceline.com Inc.	26.31	0.75	2.9
PRGY	35.43	6.37	Prodigy Communications	7.63	-0.06	-0.8
PSIX	60.93	14.00	PSINet Inc.	17.88	1.69	10.4
RSAS	93.06	15.87	Security Dynamics	61.13	-4.38	-6.7
WINK	75.00	6.00	Wink Communications Inc.	13.13	-1.63	-11.0
YHOO	250.06	55.00	Yahoo Inc.	136.88	9.08	7.1
STORAGE & PERIPHERALS UP 3.7%						
ADPT	63.56	15.37	Adaptec Inc.	22.19	-0.53	-2.3
APCC	48.84	16.00	American Power Conversion	23.38	0.44	1.9
CANNY	51.75	25.75	Canon Inc	44.63	1.81	4.2
DBD	32.87	19.68	Diebold Inc.	29.13	-0.31	-1.1
EK	78.28	53.18	Eastman Kodak Co	65.56	0.69	1.1
EMC	94.87	26.25	EMC (H)	91.81	-1.88	-2.0
IOM	6.37	2.87	Iomega	3.56	0.00	0.0
MXTR	14.81	4.81	Maxtor Corp.	7.47	-0.03	-0.4
NTAP	124.00	12.43	Network Applinace Inc.	100.19	6.06	6.4
LXK	135.87	43.15	Lexmark International Group Nc.	56.13	3.31	6.3
SEG	75.43	26.37	Seagate Technology	57.81	3.19	5.8
STK	23.93	10.00	Storage Technology	15.75	3.44	27.9
TEK	87.31	28.37	Tektronix	72.81	1.31	1.8
XRX	51.37	14.56	Xerox	16.56	0.38	2.3

KEY: **(H)** = New annual high reached in period
(L) = New annual low reached in period

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How to Contact Computerworld

TELEPHONE/FAX

Main phone number .... (508) 879-0700
All editors unless otherwise noted below
Main fax number .... (508) 875-8931
24-hour news tip line .... (508) 820-8555

E-MAIL

Our Web address is **www.computerworld.com.** All staff members can be reached via e-mail on the Internet using the form: **firstname_lastname@computerworld.com.**

All IDG News Service correspondents can be reached using the form: **firstname_lastname@idg.com.**

LETTERS TO THE EDITOR

Letters to the editor are welcome and should be sent to: **letters@computerworld.com.** *Include your address and telephone number.*

MAIL ADDRESS

PO Box 9171, 500 Old Connecticut Path,
Framingham, Mass. 01701

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REPRINTS/PERMISSIONS

Phone .... Ray Trynovich (717) 399-1900, ext. 124
E-mail .... rtry@rmsreprints.com

CONTACTING CW EDITORS

We invite readers to call or write with their comments and ideas. It is best to submit ideas to one of the department editors and the appropriate beat reporter.

Editor in Chief	Maryfran Johnson (508) 820-8179
Editorial Director, Print/Online	Patricia Keefe (508) 820-8183

DEPARTMENT EDITORS

News Editor	Anne McCrory (508) 820-8205
Features Editor	Kevin Fogarty (508) 820-8246
Assistant News Editor	Oon Tennant (508) 620-7714
Assistant Business Editor	Melissa Solomon (508) 620-7754
Technology Editor	Robert L. Scheier (508) 820-8226
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Washington Bureau Chief	Mitch Betts (202) 347-6718
West Coast Bureau Chief	Pimm Fox (650) 524-7116
West Coast Editor	Mark Hall (503) 391-1158

REPORTERS

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Internetworking, telecom/wireless, defense and aerospace	James Cope (219) 273-5369
Application development, Java, automotive	Lee Copeland (773) 394-0402
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Large systems/high-end Web server technology, security, heavy manufacturing	Jaikumar Vijayan (508) 820-8220
General assignment	Todd Weiss (717) 560-5255

OPINIONS

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FEATURE WRITERS

Gary H. Anthes (202) 347-0134;
Matt Hamblen (508) 820-8567;
Kathleen Melymuka (508) 628-4931;
Kim S. Nash (773) 275-4133;
Mathew Schwartz (508) 820-8285
Deborah Radcliff (707) 829-5823

RESEARCH

Mari Keefe, **editorial research specialist;**
Lisa Sydney, **online researcher;**
Allison Wright, **editorial research assistant**

COPY DESK

Jamie Eckle, **managing editor/production** (508) 820-8202; Jean Consilvio, **assistant managing editor/production;** Michele Lee, Bob Rawson, **senior copy editors;** Jacqueline Oay, Eugene Oemaitre, Linda Frank, Mike Parent, **copy editors**

GRAPHIC DESIGN

Tom Monahan, **design director** (508) 820-8218; Stephanie Faucher, **art director/features;** Mitchell J. Hayes, **art director/news;** John R. Brillon, April O'Connor, Oavid Waugh, **associate art directors;** Julie O'Errico, **graphic designer;** Joy Park, **editorial graphics coordinator;** Rich Tennant, John Klossner, **cartoonists**

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Linda Gorgone, **office manager** (ext. 8176); Connie Brown (ext. 8178); Lorraine Witzell (ext. 8139); Gussie Wilson (650) 524-7035, **editorial assistants**

COMPUTERWORLD ONLINE

Tom Monahan, **director, online and design** (508) 820-8218; Sharon Machlis, **managing editor/online** (508) 820-8231; Craig Stedman, **online news editor** (508) 820-8120; Marian Prokop, **online news editor** (508) 620-7717; Brian Sullivan, **communities page editor** (508) 620-7780; Peter Smith, **Web development manager;** David Ramel, **online production coordinator and e-mail newsletter editor;** William Rigby, **online services manager**

CONTRIBUTING COLUMNISTS

Allan E. Alter, Joe Auer, Jim Champy, John Gantz, Oan Gillmor, Peter G. W. Keen, Bill Laberis, Oavid Moschella, Fran Quittel, Paul A. Strassmann, Don Tapscott, Ed Yourdon

CONTRIBUTING WRITERS

Leslie Goff, Amy Helen Johnson

COMPANIES IN THIS ISSUE

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SCO's UnixWare Users Keep the Faith

Caldera, SCO execs say system will thrive

BY TODD R. WEISS
SANTA CRUZ, CALIF.

WHEN THE Santa Cruz Operation Inc. (SCO) announced at the beginning of this month that it was selling its Unix server software and professional services divisions to Linux provider Caldera Systems Inc., plenty of SCO customers wondered what the move would mean to their own operations.

At least some of the questions were answered at last week's SCO Forum2000 event here, as executives from both companies assured users that SCO UnixWare will not only survive but will also thrive.

Roland Priest, a senior project assistant at Philadelphia-based auto parts store chain The Pep Boys — Manny, Moe & Jack, said fellow information technology staffers at his company were "very concerned" about SCO's move to sell the two divisions.

With the acquisition, Priest said, the concern was that Caldera would move to drop either Unix or Linux to focus on its future.

Those concerns were addressed at the conference when Caldera's president and CEO, Ransom Love, stressed that the two product lines will coexist.

Orem, Utah-based Caldera pledged to continue the SCO OpenServer and UnixWare 7 lines, he said. "Why would we buy it to destroy what we buy?" Love said. "That wouldn't make any sense."

By the second day of the conference, Priest was more optimistic.

"The products are still going to be here; the support is going to be here," he said. "I think it's going to be stronger by combining two big pieces into one company."

Optimistic, But...

Another SCO customer, Shay Tochner, a worldwide strategic consultant at Magic Software Enterprises Ltd. in Yehuda, Israel, agreed. But to make the new arrangement work for customers, he said, Caldera must be serious about keeping the Unix and Linux lines separate.

"If they're integrating correctly, they can be a winner. But if things are going to degrade in the SCO infrastructure, then this is going to be a disaster for both parties," Tochner said.

"I'm calm," said Tochner, whose company has been using OpenDesktop, OpenServer and UnixWare for seven years. "I'm not worried. I still have to believe what they're saying. They have to be stupid to go against it."

That optimism was shared by at least one prospective reseller.

John DuPont, a product manager at ICS Advent, a Microsoft Corp. reseller in San Diego, said his company has been looking at securing a Linux vendor for several months to keep up with the movement of the industry and with requests from customers.

Caldera was a leading candidate before the acquisition of the two SCO divisions and is now an even stronger candidate because of the SCO products, he said.

"Having Caldera buy SCO, it makes it even easier for me because I see one potential source for two products," DuPont said.

SCO and Caldera announced the sale Aug. 2. SCO is keeping its Tarantella Web-enabling software line as its core business and is renaming itself Tarantella Inc. The sale of the two divisions is expected to be finalized by October.

Concerns About Caldera Mount

Caldera Systems' proposed acquisition of SCO's server and services business may not help the company remain competitive against strong Linux competitors, said analysts. While executives were explaining their plans to merge Unix and Linux last week (see story above), Caldera's quarterly results raised concerns about the company's future.

Orem, Utah-based Caldera announced a slightly better-than-expected $7.5 million loss for its third quarter ended July 31, but revenue grew a modest 9%, to $1.2 million, from the same quarter a year earlier.

"I'm surprised at how little revenue they generated," said Bill Claybrook, an analyst at Aberdeen Group Inc. in Boston. "Caldera seems to have the products in place, but they don't seem to be generating any revenues."

Claybrook said he expects that to change when the acquisition of SCO's server unit is completed. "They'll be doing $100 million-plus a year," he predicted.

But other analysts pointed out that SCO's UnixWare and OpenServer sales are declining.

"I don't see how [the SCO acquisition] helps them in the long term," said Prakesh Patel, an analyst at W. R. Hambrecht & Co. in San Francisco.

Unlike other Linux players, such as Red Hat Inc. in Durham, N.C., and VA Linux Systems Inc. in Sunnyvale, Calif., Caldera doesn't have a clear path to profitability, said Patel. "They are still competing in the [Linux] distribution space, and Red Hat has that locked up," he said.

Last week, Caldera's stock was trading at less than $6 per share for the first time, far below its $14 initial public offering price. On March 21, the day of the public offering, Caldera closed at 29 7/16.

– Dominique Deckmyn

Continued from page 1

Summer Fires

on the front lines.

This summer's fires have created "significant problems" for Butte-based Montana Power, said Patterson, with infernos burning directly under various high-voltage transmission lines, which are critical to supplying power to the strained Western power grid. When an outage occurs, an "out-of-service" signal is relayed over the company's internal communications system based on an OC-12 Synchronous Optical Network (Sonet) backbone, said Elisabeth Rice, director of utility communications at Montana Power.

Field repair crews are directed to the site of an outage by a voice radio system that operates through repeaters that "hang" off the fiber-optic backbone, explained Rice. "We can pretty much cover our entire service area with this system," she said. The Sonet backbone went into full operation a year and a half ago, she added.

Patterson said the power company relied on daily situation reports posted by the National Interagency Fire Center (NIFC) and its seven constituent federal agencies. April Baily, chairwoman of the U.S. Forest Service's webmaster staff in Washington, said her agency set up its forest fire information Web sites last year. It saw a significant spike in traffic in July, recording 16,114 hits on its fire information pages, more than double the 6,749 visits in July of last year.

Numbers are of paramount concern to Steve Jenkins, operations manager of the NIFC National Incident Communications and Infrared Operations Group, which supplies communications systems used to manage and help protect fire crews as well as to support logistics operations at base camps and direct water bombers to the fires. The NIFC has about 1,400 communications kits, which include 8,000 radios for fire operations nationwide.

Memorably Bad Season

This season is "the worst I have ever seen," Jenkins said. "I'm down to the stage where I can support only four or five more fires."

The kits provide fire managers and personnel with communications systems ranging from 2-watt voice radios used by the fire crews — with one radio allocated to every four or five people on a crew — to tactical satellite radios mounted in base camps and repeaters installed on mountaintops that relay signals from a base camp to the fire crews.

Jenkins also supplies fire teams with ground-to-air radio to help control the water bombers and maintains an inventory of radios ready for installation in military helicopters shifted to firefighting duties.

NIFC fire managers are tapping into a variety of databases to help oversee the nation's worst fire season in more than a decade. According to Mike Barrowcliff, group leader for the Forest Service's national systems group in Boise, users get daily situation reports and information on firefighting resources nationwide from a mainframe application. The reports are distributed via a Web browser at the U.S. Department of Agriculture's computer center in Kansas City, Mo.

"This shows us what is out there and helps the managers make resource-allocation decisions," Barrowcliff said.

Another key application is the Weather Information Management System (WIMS), also housed on a Kansas City mainframe and currently accessible only through aging IBM-type 3270 terminals. Last week, the NIFC awarded a $400,000 contract to Enterprise Integration Inc. in New Orleans to develop a Web-based interface to WIMS.

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FRANK HAYES/FRANKLY SPEAKING

Policing cyberspace

I WAS GOING TO WRITE about another bunch of cyberspace vigilantes — the Enterprise Virus Alert Community (EVAC), a British group that warns its members as quickly as possible about virus outbreaks. But not everyone likes it when I call groups such as EVAC and the spam-blocking Mail Abuse Prevention System LLC (MAPS) "vigilantes." After my column two weeks ago, my in-box was flooded by readers snarling about that word. Mostly, they objected to the implication that these groups are taking the law into their own hands.

Yes, that's exactly what they're doing. And that's why understanding MAPS, EVAC and groups like them is so critical for corporate IT shops.

These groups *have* to take the law into their own hands. The laws that cover spam, viruses, online pornography and privacy violations are toothless. Cops who deal with online crime have bigger concerns — fraud, break-ins, theft.

So people who want something done about these problems have to do it themselves. And they aren't just lobbying for better laws or enforcement. They're taking direct action — to block spam and porn from their systems, to speed up warnings about viruses and to blow the whistle on privacy violators.

That kind of direct action isn't a new idea, and it's not confined to the Internet. A century ago, it was vigilance committees in the Old West; today, it's neighborhood watch groups. What the law can't or won't handle, these groups step in to do.

Yes, membership is voluntary, and the members are only protecting their rights. But because they function outside established law and business practice, other laws — and rights — may collide with what they're doing.

So polling firm Harris Interactive is suing MAPS for blocking its mass e-mails. More lawsuits are inevitable. Eventually, the conflict between the right to send mass e-mail and the right to block it will be hashed out in courts and legislatures. But until then, it's all happening outside the law.

Which brings us back to EVAC, a loose coalition formed a few months ago by a handful of British e-mail administrators who wanted faster warnings of virus outbreaks and were willing to work outside their companies to get them, according to BBC News.

> *These groups* have *to take the law into their own hands.*

When a new virus hits, EVAC uses e-mail, cell phones or whatever it takes to get word to members at the 17 companies in the informal network — faster than the CERT Coordination Center, faster than news reports or warnings from antivirus vendors. With bad virus outbreaks, minutes and even seconds matter. EVAC's members are trying to get that little extra jump that will make a difference.

Sounds pretty simple and innocuous, eh? In fact, it sounds like a great idea, and EVAC's members say it helped keep damage from the recent "Life Stages" virus to a minimum.

But operating outside their companies raises other potential problems. What if e-mail administrators at two competing businesses share virus information directly? Will that run afoul of antitrust laws? Or of upper management at each company? What if another competitor wants to join the group and is rebuffed, then sues?

Suddenly, it isn't so simple or innocuous. This is new legal ground — shifting ground on which corporate IT shops need to tread with care.

Which doesn't mean EVAC is a bad idea — just that it's a lot more complicated than it first appears. Like MAPS and other private groups protecting themselves on the Internet, EVAC is pushing the limits of law on the cyberfrontier.

That's their real challenge — whether you call them vigilantes or not. ◗

Hayes, Computerworld*'s senior news columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.*

SHARK TANK

MIL SPEC Pilot fish at a Defense Department contractor gets a message from a fellow employee – and so does everyone else at the company – shortly after the secure headquarters intranet switches from a military to commercial domain name: "I have been changed over from .mil to .com and I forgot my password to get on to put my time sheet in. Could you tell me what it is? Thank you. My employee number is . . ."

IF IT'S BROKE, DON'T FIX IT Corporate IT director unilaterally decides to outsource all PC support on a per-call basis. After a 60-day transition period, he calls all in-house IT support staff and tells them to stop solving their teams' PC problems, says a pilot fish. According to the boss, they're "reducing the need for the external help desk" – and he's underspending his outsourcing budget.

SYSTEMS ANALYST Pilot fish mail-orders a hopped-up PC for his own use. It arrives, he pops open the case and finds the 933-MHz Pentium III chip just swinging free, dangling by its fan cord. He sends it back for rebuilding, and a few days later calls for a status report. They've found the problem, the service rep tells him: "The CPU wasn't seated correctly."

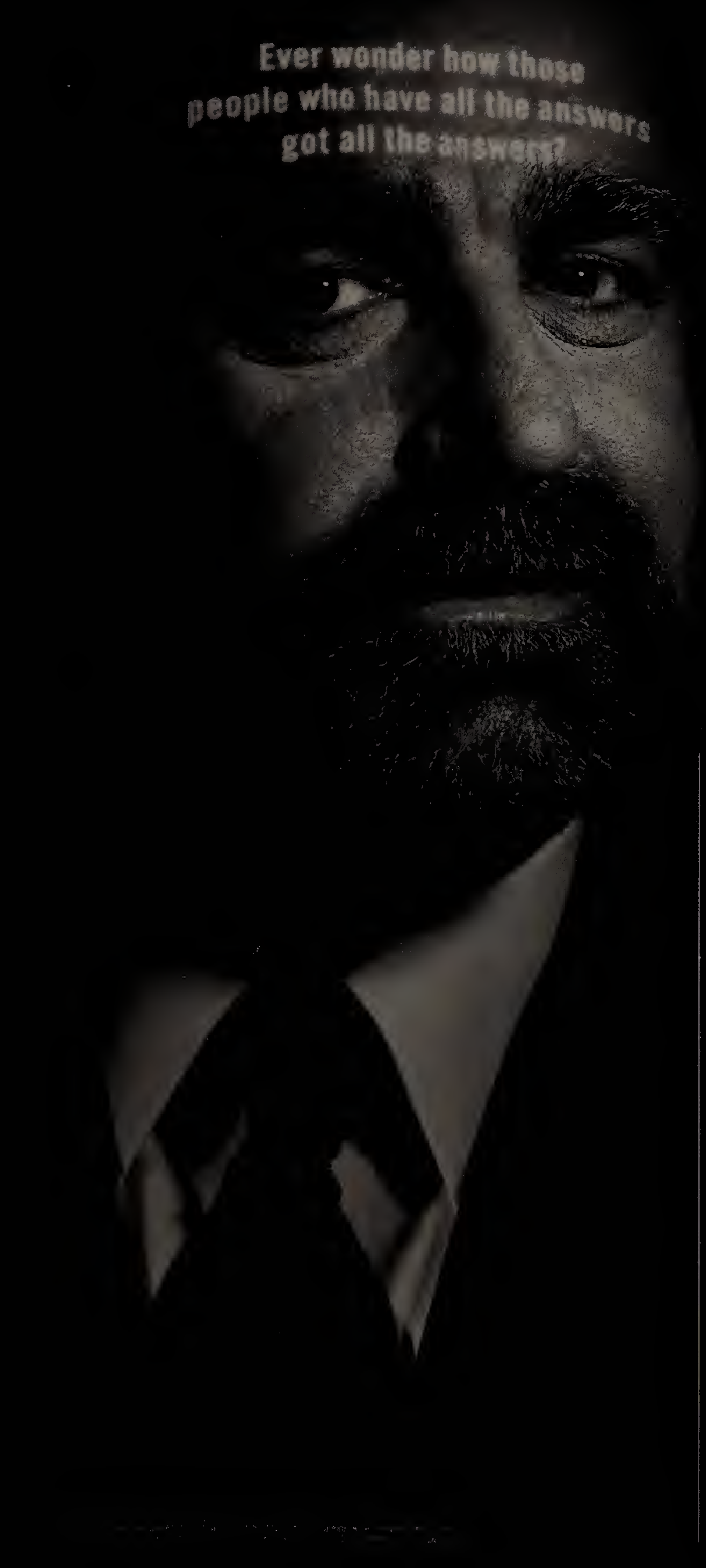
A NETWORK PRINTER stops working, so this pilot fish investigates. Turns out the printer was moved across the hall – where there's no network port. A supervisor tells the fish she needed a file cabinet where the printer was. She moved the printer, but "didn't know what to do with this extra red wire coming out of it."

UNDERPOWERED Citrix server is making life miserable and unproductive for this company's field staff. But when a vendor offers a free trial of a fast new server, the boss says fuggedit. His logic? Once the field staff has worked on a faster server for a month, they'll never want to go back – and he'll have to shell out $15,000 to keep the new system.

Tell me your tale: **sharky@computerworld.com.** If your story prints, you get a sharp Shark T-shirt. And get more online every day at *computerworld.com/sharky.*

The 5th Wave

"I know my modem's in the microwave. It seems to increase transmission speed. Can you punch in 'Defrost'? I have alot of emails going out."



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